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# Hot Phones

**A**bout three years ago, when we first brought our Bull bulletin board system on line, microcomputer telecommunications was such a sophisticated discipline that there was no concern about fools or pirates... you had to be a bit blessed just to get the whole mess working.

This, of course, was before the advent of VIC Modems and other low cost on line hardware. At the moment virtually anyone who wants to can use the telephone system for other than human communications.

Now, microcomputers were far from being the first users of modems... the mainframe systems have been squealing over the wires for years and, not surprisingly, they use the same protocols and standards as does everyone else. In the past few months it has been noted that things like the University of Toronto, Crown Data and the Visa billing computer were all accessible over the phone.

Of course, you can't just call up Visa and make your debts vanish. These computers are protected by password schemes that make adventure games look like a walk in the short grass. However, there is that element of the species that gets into puzzles like this, and "cracking" mainframes has become a sort of an underground sport.

It's probably pointless to say that the owners of the victim computers are not amused. Some of the crackers have managed to do some heavy damage in their wanderings. This all ties back into bulletin boards with a number of complex knots.

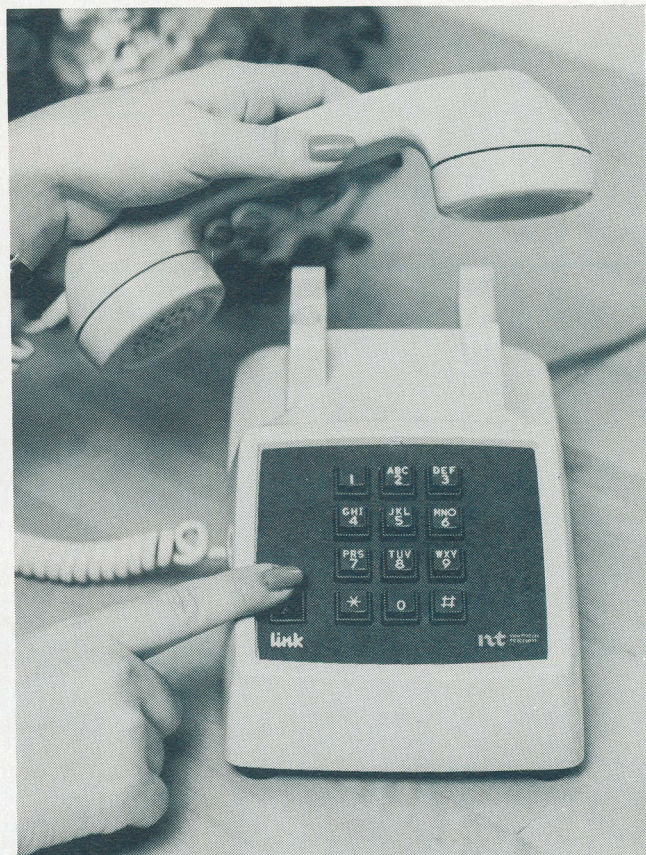
The situation which is shaping up in the States is starting to look like a bit of a circus. The breakup of AT&T has freed the local phone companies from a lot of heavy corporate inertia... something which, when applied to Ma Bell, can only be thought of as having been an admirable form of restraint. A number of these companies have been experimenting with charging modem users business phone rates.

At the same time, the American government and minions thereof, have been taking an interest in the *legal* use of modems for bulletin board systems. While legislation specifically defining or regulating these things doesn't exist as of yet, in a bit of a landmark security officers of Pacific Telephone recently seized the hardware of a Los Angeles BBS operator, Tom Tcimpidis, and thereafter laid felony charges on him. Amongst the twenty-seven hundred messages on Tcimpidis' BBS was one which contained messages revealing telephone credit card numbers and two Sprint access codes.

This is, to say the least, a very unportentious precedent. It makes the system operator legally responsible for everything on his or her system. To carry the matter to extremes, the operator of an RCP/M system would be legally obliged to insure that every line of code in maybe fifty or a hundred megabytes of stuff is actually in the public domain and legitimately distributable.

On the other hand, there are pirate boards, ones which have been put on line with the intention of collecting and distributing information on the piracy of software and on cracking mainframe systems. Of late we have seen the rise of systems such as the *Buckaneer's Phreak House* and *Mississauga Networks II*, which, as of this writing, was offering about twelve kilobytes of cracking information for downloading by anyone who called.

While the number of users of these systems represents a small proportion of the telecommunications community, they are a visible group... and one likely to be pointed at if the piracy issue is left upon by the media on a slow newsday. Unfortunately, the distinction between straight up BBS's and pirate BBS's will probably blur in the minds of people who don't know what either is.



There are a number of important issues here. To begin with, while modems are still moderately specialized devices this will probably not be so in five or ten years. They may well be very common, with more and more services and stores making information available on line. If, by that time, Bell has managed to put in place surcharges for modem users, it will be set up to charge essentially everyone for using what could become a fairly essential communication tool.

Telecommunications has grown in North America far more so than in other parts of the world because the phone system is structured to permit it. In Britain, where every call is paid for individually, bulletin boards are all but unknown. Telecommunications is one of the things which can make computer technology universally applicable to people... as opposed to just being a programmer's novelty... but this is predicated on the telecommunications medium being fairly accessible.

It's a worthwhile trip to keep an eye on your local branch of Mother.

Secondly, the pirate bulletin board issue is rather more than just a bit of illicit fun... it promises to become a scapegoat for a lot of the growing pains of the industry and could be used as an argument for restricting the use of modems.

This too, is something to consider if you log onto one, leave information on one or pass the number of one along to other users.

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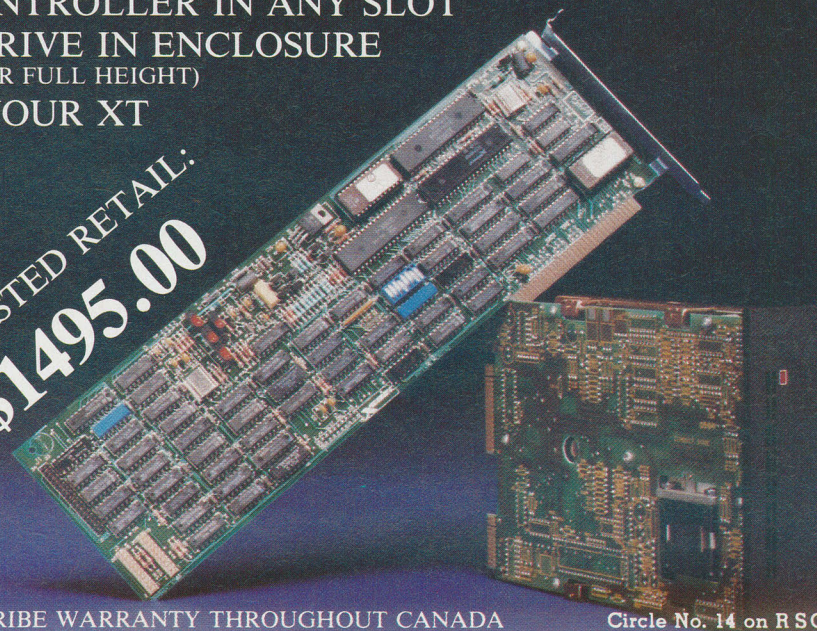
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# Directory of Paraphernalia

A vintage NCR computer terminal is shown at an angle. The monitor displays a bar chart titled 'PERSONNEL RATIO' with two data series: 'Production Personnel' (blue) and 'Non-Production Personnel' (red). The x-axis shows years from 1980 to 1983. The y-axis ranges from 0 to 10. The control panel on the right features two vertical sliders, a 'Brightness' knob, a 'Contrast' knob, a 'Power' button with a green indicator light, and a power switch. The NCR logo is visible in the top right corner of the terminal's frame.





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# Directory of Paraphernalia

With accessories microcomputers can be extremely serious, lurking on desks doing nothing but word processing and spreadsheets. However, this is anything but the situation. There are more things to add onto, plug into, slip under, stand on top of, snap inside, attach to, detach from and associate with your system than most users ever get a chance to think about.

There is so much paraphernalia available for micros that a lot of it gets left in obscurity. You probably don't even suspect the existence of half the stuff you can get. That's what this directory is all about.

In compiling the Directory of Paraphernalia we set out to list the most interesting and useful microcomputer accessories. We've omitted the really easily found stuff, like the computers themselves, printers and monitors. We've also skipped stuff which was so obscure that we couldn't fathom uses for it. The following pages list a selection of the finest paraphernalia going, hardware to enhance the power of your system, to implement new and stunning applications and to realize the most important function of a computer...

To have fun with.

## Computer Furniture

### Accoform Furniture

Acco has just launched a new line of furniture called Accoform. The 509 series, features fully and partially adjustable computer tables, extensions, printer stands and more. The 508 series features fixed height computer tables, printer stands, and mobile stands.

All items are priced separately.

*Manufactured by Acco Canadian Company Limited, 501 McNicoll Avenue, Willowdale, Ontario M2H 2E2 (416) 499-1000.*

### Royal Furniture

Royal Seating has a variety of furniture products. They include a line of printer stands, and a line of work stations for microsystems.

**Royal 5700 Printer Stand** has a scratch resistant walnut woodgrain plastic top. It stands 27 inches high without the optional casters.

**Royal 5900 Work Station** is portable with an adjustable chrome base and monitor shelf. It has a laminated work surface in walnut or oak. Priced individually.

*Manufactured by Royal Seating Corporation, PO Box 753, Cameron, TX 76520 (817) 697-6421.*  
*No Canadian distributor.*

### Omnium PC Furniture

**Omnium's PC Caddy** Portable self-contained IBM PC workstation with adjustable keyboard and monitor platforms.

The suggested retail price is \$299.00 U.S.

**Omnium's SpaceSaver 1** An adjustable arm that supports your PC Monitor above your work surface.

The suggested retail price is \$199.00 U.S.

**Keyboard Storage Rack** This attaches to the monitor support tray of the Omnium's Spacesaver 1.

The suggested retail price is \$45.00 U.S.

**Omnium's System Sidemount** Removes the CPU system from your work surface and holds it in a vertical position.

Suggested retail price is \$79.00 U.S.

**Omnium's SpaceSaver System** A counter-balanced arm supports the PC monitor and the keyboard above the working surface.

Suggested retail price is \$499.00 U.S.

**Omnium's Mini-Printer Stand** The paper feeds from directly under the stand. This is for use with most small desktop computer printers.

Suggested retail price is \$36.00 U.S.

### Omnium's Static Control Accessories:

**Touchbase Series** Static control wrist rests are available for the IBM PC, the Apple II/IIe and the TRS-80 series.

Suggested retail prices: Touchbase 1 \$49.99 U.S., Touchbase 2 \$39.99 U.S., Touchbase 3 \$39.99 U.S.

**Touchmat Series** These static dissipative mats sit directly under the computer and are available in two sizes.

Suggested retail prices: 24" deep x 26" wide \$59.99 U.S., 18" deep x 26" wide \$49.99 U.S.

**Omnium's Keyboard Storage System** The keyboard is stored under the CPU. It has a static control wrist rest that also functions as a slide-out drawer.

Suggested retail price is \$89.00 U.S.

**Omnium's Keyboard Stepdown** The Keyboard Stepdown also features a static control wrist rest.

Suggested retail price is \$139.00 U.S.

**Omnium's CRT Optimizer:** The anti-glare lens are available to fit every leading personal computer monitor.



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TEAC 55F 80trDS	379 <sup>95</sup>
TANDON 40trSS	249 <sup>95</sup>
CASE & POWER SUPPL.	60 <sup>00</sup>

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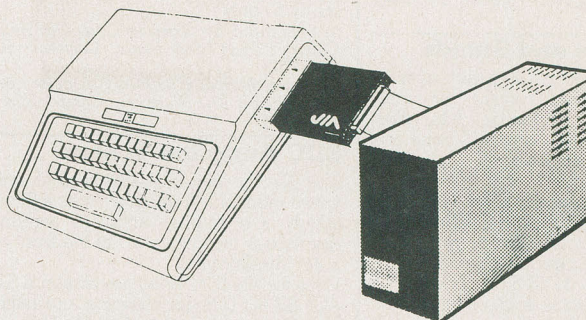
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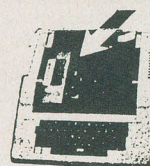
### 64K

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Suggested retail price is \$39.00 U.S.

Manufactured by Omnium Corporation, 201 North Second St., P.O. Box 186, Stillwater, Minnesota 55082 (612) 430-2060.

Canadian distributors:

Automated Computers, 803 Bannatyne Avenue, Winnipeg, Manitoba R3E 0W4.

Technograph, 356 McRae Drive, Toronto, Ont. M4G 1T5.

## SGW Dust Covers and Stands

Dust Covers are available for a variety of computers and printers. Dust covers for some Brother, C. Itoh, Epson, Gemini, Juki, Nec, Okidata, PMC, Silver Reed, Smith Corona and Starwriter printers are available.

Priced from \$10.95 U.S. to \$13.95 U.S.

Dust covers for are available for Compaq, Eagle Portable, Eagle PC, Eagle 1,2,3,4, IBM PC (2 piece), Kaypro, Osborne/Osborne Exec, Osborne W/Monitor and Seequa Chameleon.

Priced from \$13.95 U.S. to \$15.95 U.S.

Custom stand for Kaypro is angled for screen viewing and has a storage shelf.

Price \$45.00 U.S.

Printer stands are available that can be used with 80-column printers. The paper is stored under printer with optional slot for bottom feed.

Price for small stand \$29.95 U.S.; with slot \$34.95 U.S.; for large stand \$34.95 U.S.; with slot \$39.95 U.S.

Manufactured by SGW Enterprises Inc., 722 Genevieve St., Suite J, Solana Beach, CA 92075 (619) 755-8324. No Canadian distributor.

## Miscellaneous Accessories

### Databind Binder

Databind is a two ring binder that fits pin feed computer paper either vertically or horizontally.

Manufactured by Databind, PO Box D, Dept. 11, Margate, NJ 08402.

No Canadian distributor.

Price N/A.

### Kleertex Keyboard Templates

Kleertex keyboard templates have alphabetized commands required to learn and operate your program. The templates are made of sturdy, non-scratchable, non-glare, colour co-ordinated plastic.

Price \$12.50 for Do-It-Yourself blanks; \$24.95 for Single program templates; and \$34.95 for Double program or Extensive program templates.

Manufactured by Creative Computer Products, 7960 Convoy Court, San Diego, California 92111 (619) 268-0793.

Canadian distributor: Trillium Computer Resources, 423 Grangewood Dr., Waterloo, Ontario N2K 2H1 (519) 886-4404.

### Safeskin

Safeskin protects your PC keyboard against spills, dust, ashes and any other foreign matter. Safeskin is a molded keyboard cover that fits over the keyboard.

Price \$29.95 U.S.

Manufactured by Merritt Computer Products, Inc., 2925 LBJ Freeway, Suite 180, Dallas, Texas 75234 (214) 942-1142.

No Canadian distributor.

### PC Dust covers and Diskette Jackets

The PC Dust Guard covers, are for brand name computers to prevent dust and moisture from damaging internal components. They are made of anti-static vinyl.

Price of the covers range from \$10.85 U.S. to \$21.95 U.S. Available from U.S. only.

**The File-it** Diskette Jackets are for use with diskette storage and filing devices. Tripple tabbed jackets are available.

Price for a package of 24-5/4" is \$7.95 U.S.; for a package of 24-8" is \$14.95 U.S. Available from the U.S. only.

Manufactured by Creative Computer Products, 7960 Convoy Court, San Diego, California 92111 (619) 268-0793.

Canadian distributor: Trillium Computer Resources, 423 Grangewood Dr., Waterloo, Ontario N2K 2H1 (519) 886-4404.

### SDC Antiglare Screen

The SDC screen is available to fit over 200 different monitors. Available also is a Power Screen, which is a regular antiglare screen that also discharges the static field at the front of the computer display tube.

Price for the SDC antiglare screen is \$39.95 U.S. plus \$3.00 U.S. for shipping and handling.

The Power Screen is \$49.95 U.S. plus \$3.00 U.S. for shipping and handling.

Manufactured by Capitol Sales Company, 13740-J2 Research Blvd., Austin, TX 78750 (512) 250-8757.

No Canadian distributor.

### Quilted Dustcovers

Covers A Lot quilted, anti-static, machine washable dustcovers for PC's are hand-made. They are made from a cotton/polyester blend and come in grey, navy, rust, chocolate, wine, and cream.

Prices begin at \$20.00 U.S.

Manufactured by Covers A Lot, PO Box 369 La Honda, CA 94020 (415) 747-0352.

No Canadian distributor.

### Paper Conveyor

The Paper Conveyor from Valinco Automation is for printing up letters, invoices, personal letters, invoices and envelopes.

The printing format is 84 lines per page and 6 lines per inch.

Priced at \$56.00.

Manufactured by Valinco Automation Ltd., 2465 Dunwin Drive, Unit 4, Mississauga, Ontario L5L 1J9 (416) 828-7411.

### Copy Cover

The Copy Cover, when flipped up is a copyholder for manuals, documents, or computer printouts up to 11 x 14-7/8".

When the Copy Cover is flipped down it is a dustcover that protects the keyboard.

Suggested retail price is \$39.95 U.S.

Manufactured by C-Thru Products, 6351 Lake Worth Rd., Suite 111, Lake Worth, FL 33463 (305) 439-4333. No Canadian distributor.

### Eldon Information Processing Accessories

Eldon has a variety of office products. These include: disk files, stackable trays, data stands, media bank trays with cassette inserts. They also have the Hot Rack and the holder for disk files. Another item they offer is the Data Dolly which transports boxes of printout.

Priced separately.

Manufactured by Eldon Office Products, 500 Esna Park Drive, Markham, Ont.

### Computer Cleaning Kit

The Computer Cleaner Kit has everything to clean out your entire system. It has tools to clean out your printer, keyboard, all exposed surfaces, and your disk drives.

Price \$24.95 U.S.

Manufactured by Central Valley Electronics, PO Box 33102, KC, MO 64114 (816) 444-5215.

## Portable Computer Carrying Bags

These custom-designed portable computer bags are protective, light and versatile. The bags are made of vinyl-backed nylon and high impact foam padding. They have heavy duty handles and adjustable shoulder strap.

Priced individually.

Manufactured by Riviera Manufacturing Company, 1181 Finch Ave., West, Unit No. 10, Downsview, Ontario M3J 2V8 (416) 665-8766.

## The Disk Notcher

The Diskette Notcher is for Apple IIe/c, C64 and Atari computers. It allows Apple and Atari users to write on the flip sides of single sided diskettes by making another write-enable notch.

Price \$19.00.

Manufactured by Quorum, Industrial Park Station, Box 2134, Oakland, CA 94614 (415) 531-0411.

Canadian Distributor Microcom, 2060 Trans Canada, Dorval, Quebec, H9P 2N4 (514) 683-4030.

## Terminals and Graphics Hardware

### Graphos III

Graphos III is a colour graphics terminal capable of displaying 16 windows simultaneously, which can zoom-in on, or smooth scroll-across images, and overlay without disrupting either.

Retail list price is \$69.95 U.S. for the 13' monitor. Manufactured by Ithaca Inter Systems, 1650 Hanshaw Rd., New York 14850 (607) 273-2500.

No Canadian distributor.

### TEK Colour Graphic Terminals

**TEK 4105 Computer Display Terminal:** colour graphics and alphanumeric capabilities for the technical professional. Screen size is 330 mm (13 inches).

Price N/A.

**TEK 4107 Computer Display Terminal:**

Desktop colour terminal with alphanumeric capability and local graphics manipulation. Screen size is 330mm (13 inch).

Price N/A.

**TEK 4109 Computer Display Terminal:** Desktop colour terminal with alphanumeric capability and local graphics manipulation.

Screen size is 483 mm (19 inches).

Price N/A.

**TEK 4170 Local Graphics Processing Unit:**

This Local Graphics Processing Unit provides the 4105, 4107 and 4109 Computer Display Terminals with stand-alone power for graphics tasks.

Price N/A.

**TEK Graphics Copier:** TEK 4612 Dec-compatible graphics copier: The 4612 copies graphics and alphanumeric exactly as they appear on your display. The copy time is not affected by the density of the image.

Price N/A.

**TEK 4695 Colour graphics copier:** The 4695 makes colour graphic copies and can function as a bi-directional, dot matrix printer with a print speed of 20 characters per second. It can also print on a specially formulated clear transparencies.

Price N/A.

Manufactured by Tektronix Canada Inc., P.O. box 6500, Barrie, Ont. L4M 4V3 (705) 737-2700.

For other Canadian distributors contact: Tektronix Canada Inc.

P.O. Box 6500, Barrie, Ont., L4M 4V3 (705) 737 2700.

### Video Van Gogh

The Video Van Gogh is a video digitizer that interfaces TV cameras to the PC. Software library sub-routines allow digitization and display of a video picture.



Price \$497.00, and for the software \$123.50.  
Manufactured by Tecmar, Inc., 6225 Cochran Rd., Solon (Cleveland), Ohio 44139 (216) 349-0600.  
Canadian distributor is EMJ Data Systems, 291 Woodlawn Rd., Unit #3, Guelph, Ontario N1H 7L6 (519) 837-2444.

### STB Graphix Plus II

The STB Graphics Plus II is a video adapter board for the IBM PC, the IBM Portable computer and most IBM hardware compatibles. Graphics Plus II is used to connect the computer to a variety of video display monitors and printers.

Priced at \$495.00 U.S., and with the optional clock \$515.00 U.S.

Manufactured by STB Systems Inc., 601 N. Glenville, Suite 125, Richardson, Texas 75081 (214) 234-8750.  
No Canadian distributor.

### Graphics Master

Graphics Master is equipped with 128K of on-board display buffer memory. Graphics Master is compatible with the IBM Monochrome and Colour/Graphics Adaptors. Graphics Master will run all IBM software for the PC.

Price: \$1000.00.

Manufactured by Tecmar Inc., 6225 Cochran Rd., Solon, OH 44139 (216) 349-0600.  
Canadian distributor is EMJ Data Systems, 291 Woodlawn Rd., Unit 3, Guelph, Ont., N1H 7L6.

### Multiflex S-100 Video Board

This board is an intelligent, I/O mapped, 80 x 24 Video Display Board. It is based on the 8275 programmable CRT controller, the 8257 programmable DMA controller, and Z80 processor. Provided on the board is 8K of static RAM.

Price: \$269.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.  
Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### Multiflex Video Display Terminal

This terminal is a semi-intelligent system which is controlled by a Z80A microprocessor and a 6845 CRT controller chip. It includes two RS-232 ports, 4K buffer case and power supply.

Price: \$319.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2, (416) 921-8941.  
Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### IBM Compatible Colour Graphics Video Board

This board was designed to be compatible with a wide variety of display systems. The two types of output connectors provided are: 1) composite baseband video, and 2) direct RGB drive. In addition a light-pen port is included. This card can be used in black and white with comparable resolution.

Price: \$339.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.  
Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### Multiflex 80 x 24 Apple Video Card

The Multiflex 80 x 24 Video Card features 80 columns by 24 lines display, with upper and lower case, reverse video, and a built-in software switch allowing you to switch from the Apple's 40 column, and the video cards 80 column from the keyboard.

\$85.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.  
Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### TRS-80 Data Terminal

The Pt-210 Portable Data Terminal allows you to access your office computer and data networks anywhere you go. It has a quiet printer and a built-in acoustic coupler.

Price: \$1399.

Manufactured by Radio Shack, Division, Tandy Electronics Ltd., Bayview Dr., Box 3400, Barrie, Ontario L4M 4W5 (705) 728-6242.

### Video Display Terminal

The H/Z-29 video display terminal emulates the functions of the H/Z-19 video terminals. It has a detachable keyboard, and a non-glare 12" diagonal CRT. It communicates at speeds from 75-19200 baud, in half or full duplex.

Price for the kit is \$995, the price assembled is \$1395.

Manufactured by Heath-Zenith Company, 1020 Islington Ave., Toronto, Ontario M8Z 5Z3 (416) 232-2686, 800-268-2502.

### Apple Sprite Graphics

Sprite I lets you create smooth, flicker free animation. The software that is included, allows you to create and move sprites, and lets you paint colourful backgrounds. The multi-plane action allows you to move sprites over and under each other.

Price \$149.00 U.S.

Sprite II adds realistic sound effects to all the action of Sprite I. You can program the sound yourself. Sprite II includes a sound generator.

Price \$249.00 U.S.

Supersprite has actual speech using the Echo II. It also has the ability to simultaneously join sprite graphics and Apple programs together on the screen.

Price \$395.00 U.S.

Manufactured by Syntex Inc., 10635 NE 38th Pl., Kirkland, WA 98033 (206) 828-4884.

No Canadian distributor.

### Multigraph

Multigraph is a graphics adapter board which expands your image in both colour and monochrome. As needs change, the system may be upgraded with a variety of optional features.

Price for the MGB basic configuration is \$499.00 U.S.

Manufactured by Profit Systems, 30150 Telegraph Rd., Birmingham, MI 48010 (313) 647-5010.

A Canadian dealer is: Affordable Computers, 870 University Avenue West, Windsor, Ontario N9A 5R9 (519) 258-1122.

### Micron Eye

Micron Eye is a solid-state digital imaging system for the Apple. Electronic shutter may be controlled manually or by the software. It is capable of transmitting 4 ft., 15 frames/second.

It can be used for graphics input, security and more.

Price \$380.00.

Manufactured by Micron Technology Inc.  
Distributed by Repco Electronics Co., Ltd., 119 Labrosse Ave., Pointe Claire, Quebec H9R 1A3 (514) 694-1877.

### AT-1 Kaypro Video Board

AT-1 video board for the Kaypro 2 and Kaypro 4 computers lets you display reduced intensity, reverse video, blinking, and reverse screen all in addition to standard video.

Price: \$225.00.

Manufactured by JFN Industries, 361 North Fuller Avenue, Los Angeles, CA 90036 (213) 939-4105.  
Canadian distributor: Computron, 10641-123 Street, Edmonton, Alberta T5N 1P3.

## Disks and Mass Storage Devices

### TRS-80 Hard Disk Drives

This hard disk system is a 3 platter, 6 surface 5¼" disk drive employing sealed media with a self contained, recirculating filtered air system. The formatted capacity is 11.6 MB for primary drive and 12 MB for secondary drives.

Price of primary drive is \$4199, and for secondary drive \$2799.

Hard Disk Systems are manufactured by Radio Shack Division, Tandy Electronics Ltd., Bayview Dr., Box 34000, Barrie, Ontario L4M 4W5 (705) 728-6242.

Model 4/III/1 5-megabyte Hard Disk System has a high speed, making it good for inventory, accounting and data base filing. You can add up to three secondary drives which gives you a total of 20 MB of storage.

Price for the primary drive is \$2799, and for the secondary drive is \$2499.

The TRS-80 Model 4 Hard Disk System can store over 5 million characters of data. This system includes 64K 2-disk Model 4, 5 MB hard disk drive, 80-column DMP-200 dot-matrix printer and printer cable.

Price: \$6756.95.

Manufactured by Radio Shack, Division, Tandy Electronics Ltd., Bayview Dr., Box 34000, Barrie, Ontario L4M 4W5 (705) 728-6242.

### Hard Disk Drives

Percom has a new generation of high performance hard disk drives for a variety of computers. The new product line provides users with speed enhancements, and memory caching.

Suggested retail price for the Percom PHD Hard Disk subsystem is \$1895.00 U.S. (for a 5 MB) and up.

Manufactured by Percom Data Corporation, 11220 Pagemill Rd., Dallas, Texas 75243 (214) 340-7081.  
No Canadian distributor.

### Apple Compatible Disk Controller

Multiflex Floppy Controller features include plugging right into slot #6 in your Apple computer, and it is capable of handling up to two Apple compatible drives.

Price: \$69.00.

Multiflex Floppy Controller for 8" drives, plugs right into the Apple computer and allows you to use 8" DS DD Disk drives.

(software not included).

Price available on request.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.  
Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### Multiflex Apple Compatible Disk Drive

The Multiflex Disk Drives are Apple compatible and are Canadian made with a 1 year warranty.

Price \$248.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.  
Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### IBM Compatible Hard Drive

This disk drive is a two-platter random access device that fits into the same space as a 5¼" floppy disk drive. Each surface has one movable head to service 306 cylinders with a total capacity of 10 megabytes.

Price: \$1669.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.  
Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.



# Directory of Paraphernalia

## Hard Disk Subsystem

Budgetron hard disk subsystem, turns your IBM PC or compatible into an XT. It contains a 10 MB 5¼" Winchester disk drive, Winchester controller, optional auxiliary power supply, internal cables, BIOS and installation manual.

Price N/A.

Manufactured by Budgetron Inc., 1601 Matheson Blvd., Unit 3, Mississauga, Ontario L4W 1H9 (416) 624-7323.

## AT-1 Apple Compatible Drive

Model AT-1 single sided disk drive is compatible with the Apple II+/ IIe. It has 163K Bytes, 40 track capability. It also has half track capability.

Price N/A.

Manufactured by Budgetron Inc., 1601 Matheson Blvd., Unit 3, Mississauga, Ontario L4W 1H9 (416) 624-7323.

## Shugart Disk Drives

Shugart's 3.5-inch 300 is a single-sided microfloppy drive offering 500 K bytes of capacity and six-millisecond track-to-track access time. Interface compatible with the standard 5.25-inch minifloppy disk drives.

Price \$205.00 U.S.

**Shugart's 350** is a double-sided microfloppy disk drive offering 1 MB of capacity and 6 millisecond track-to-track access time. Designed to operate with the 3.5 inch hard shell cartridge media.

Price \$279.00 U.S.

**Shugart's 455** (48 tracks/inch) and **465** (96 tr) are double-sided drives offering up to 500 Kbytes or one megabyte of capacity, respectively. They feature half-height, direct drive DC motor, custom LSI circuitry, and media and interface compatibility with 400/450 family of minifloppy disk drives.

Price for the 455 is \$237 U.S., and for the 465 is \$295 U.S.

**Shugart's 475** features 1.6 MB of unformatted capacity and three milliseconds track-to-track access time. It offers the same performance as the double-sided eight-inch floppy drive, in the form factor of half the height 5.25 inch minifloppy.

Price \$323.00 U.S.

**Shugart's 700** series of half-height 5.25-inch Winchester include the 706 and the 712. The 706 is 5 MB and the 712 is 10 MB. The feature four-point shock mounts, and dedicated head landing/shipping cones.

Price for the 706 is \$592.00 U.S., and for the 712 is \$667.00 U.S.

**The Shugart 700S** series of 5.25-inch Winchester disk drives are independent from the host CPU. The 700S series offers 5.0 and 10.0 MB of formatted capacity.

Price for the 10MB \$957.00 U.S., and for the 5MB \$883.00 U.S.

**Optimem 1000** optical disk drive, stores 1000 MB of capacity on one side of a 12-inch disk and reads and writes data with a laser beam using non-erasable technology.

Price \$10000.00 U.S.

Manufactured by Shugart Corporation, 401 Alden Rd., Unit 11, Markham, Ont., L3R 4N4 (416) 475-2655.

## Semidisk

Semidisk I is a high performance disk emulator for the S-100 Bus. It features CPM compatibility, arbitrary drive assignment, fast access, up to 1 MB/board, expandable to 8 MB, low power consumption, battery back-up provision, and built-in parity check.

Price for 256K \$895 U.S., for 512K \$1095 U.S., for 1 MB \$1795 U.S.

**Semidisk II** has the same features as Semidisk I, but it is faster. It also offers up to 2 MB/board and

a 16 bit I/O addressing.

Price for 512K is \$1395 U.S., for 1 MB \$2095 U.S.

The **TRS-80 Model II Semidisk** solid state disk emulator is the same as Semidisk I but it is for the TRS-80 Model II.

Price for 512K \$1095 U.S., and for 1 MB \$1795 U.S.

The **IBM-PC Semidisk** solid state disk emulator is for the IBM PC. It features IBM PC-DOS compatibility, fast access, up to 1 MB/board, expandable to 8 MB, low power consumption, battery back-up provision, and hardware parity checking.

Price for 512K \$1095 U.S., and for 1 MB \$1795 U.S.

All semidisk manuals alone cost \$10.00 U.S.

Manufactured by SemiDisk Systems, Inc., PO Box GG, Beaverton, Oregon 97075 (503) 642-3100.

No Canadian distributor.

## Trustor 10 and 30

The Trustor 10 (10MB) and 30 (30 MB) are Winchester hard disk units for micros. They are compatible with Apple II, IBM PC, Eagle PC, the Compaq portable, and the Columbia.

Price N/A.

Manufactured by Datamag, 432 Lakeside Drive, Sunnyvale, CA 94086 (408) 720-0800.

No Canadian distributor.

## Corvus Winchester Disk Systems

Winchester disk systems are available for the Apple II, Apple IIe, Apple III, IBM PC, Zenith Z100, TRS-80 Models I, II, and III, Dec Rainbow 100 PC, Compaq Portable computer, and the Franklin Ace 1000.

Price for the 5MB is \$2995, for the 11MB \$4095, for the 20 (16.6)MB \$4995, and for the 45MB \$7995.

**The Bank** The Bank is a random access device that stores information on a removable tape. It was designed for transferring information to and from Winchester drives on your network.

Price \$3695.

**Corvus Omninet** Omninet is a local area network that can easily expand your storage, and let you expand when your system needs it, and is compatible with popular computers.

Price N/A.

Manufactured by Corvus Canada, 1200 Aerowood Drive, Unit 47, Mississauga, Ont. L4W 2K7 (416) 624-4899.

## The IDEAdisk for the IBM PC

The IDEAdisk subsystem for the IBM PC/XT offers up to 5MB to 40MB storage capacity based on a 3.9" Winchester hard disk drive design. Price ranges from \$1645.00 U.S. to \$3545.00 U.S.

Manufactured by IDEAssociates, Inc., 7 Oak Park Drive, Bedford, MA 01730 (617) 275-4430.

No Canadian distributor.

## Tecmar Hard Drive for Macintosh

Tecmar's Mac Drive gives you a 10 megabyte fixed hard disk or a 5 megabyte removable hard disk. You can add a 5 megabyte removable hard disk to either of the above.

Price for 10MB \$2713.20, for the 5MB \$2713.20.

Manufactured by Tecmar Inc., 6225 Cochran Rd., Solon, OH 44139 (216) 349-0600.

Canadian distributor is EMJ Data Systems, 291 Woodlawn Rd., Unit 3, Guelph, Ont. N1H 7L6.

## Great Lakes PC Hard Disk Systems

Great Lakes Superior series (10, 23, 40, 65, 140 Mbyte) external hard disk subsystems are for IBM PC or compatible computer. The Great Lakes Quartermaster 23 offers an optional high speed tape back-up module as well.

Suggested retail prices for the 10MB \$2540.00; for the 23MB \$3800.00; for the 40MB \$5420.00; for the 65MB \$7280; and for the 140MB \$1150. The suggested retail price for the tape drive back up is \$2175.00.

Manufactured by Great Lakes Computer Peripherals Inc., 2200 West Higgins Road, Suite 245, Hoffman Estates, IL 60195 (312) 884-7272.

Canadian Distributor is Crowntek, 3000 Steeles Ave. East, Markham, Ont. L3R 4T9 (416) 493-0800.

## CBM Disk drive and Datasette

C-1541 Disk Drive is an external 5¼-inch floppy diskette recorder and player with high speed capacity for programs and data.

Suggested retail price is \$49.00.

C-1530 Datasette is an external tape recorder and player which includes an interface cable.

Suggested retail price is \$399.95.

Manufactured by Commodore, 3370 Pharmacy Ave., Agincourt, Ont., M1W 2K4 (416) 499-4292.

## ComFiler Hard Disk for Epson QX-10

ComFiler Hard Disk CR-150 is a 5¼" Winchester Disk with 10 MB capacity and low power consumption.

List price is \$2999.00.

Manufactured by Comrex International, Inc., 3701 Skypark Drive, Suite 120, Torrance, CA 90505.

Canadian distributor: Epson Canada Ltd., 21 Progress Court, Unit 18, Scarborough, Ont. M1G 3V4 (416) 431-5588.

## Helix PC Bubble Disk

The Helix PC Bubble Disk is a half-megabyte bubble memory expansion board for the IBM personal computer. Formatted as a fixed disk, the Bubble Disk operates off the computer's power supply without requiring increased or external power.

Suggested retail price is \$1495.00 U.S.

Manufactured by Helix Systems and Development Corp., 8123-25 Remmet Ave., Canoga Park, CA 91304 (818) 710-0300.

## Power Supplies and Filters

### Power Directors

The Power Directors gives you four lines of defense: noise filtration, spike elimination, surge clamping, and overcurrent protection. Power Directors give you control of the off/on status of every peripheral in your system. Model P12 also has provision for a Data Director option.

Price N/A.

Manufactured by Computer Accessories, 7696 Formula Place, San Diego, California 92121 (619) 695-3773.

No Canadian distributor.

### Power Supply

Budgetron's SPS-1100 (100 W) and SPS-1130 (130 W) switching power supplies, are made to fit with their PC case.

Twelve pin connector with three disk drive connectors for SPS-130 and two for SPS-100.

Price N/A.

Manufactured by Budgetron Inc., 1601 Matheson Blvd., Unit 3, Mississauga, Ontario L4W 1H9 (416) 624-7323.

### Semidisk Battery Backup Unit

The Semidisk Battery Backup Unit is a self contained package that will protect your data for up to 6 hours if the power is interrupted. It also has its own power supply.

Price for the Battery Backup is \$150.00 U.S.

Manufactured by SemiDisk Systems, Inc., PO Box GG, Beaverton, Oregon 97075 (503) 642-3100.

No Canadian distributor.



## DataSaver

Datasaver is an AC power backup that ensures your data against power failures and brownouts. Datasaver automatically switches on during a power failure. There is also a screen alert and alarm buzzer that goes on during a power outage.

Prices range from \$599.00 to \$1099.00.

Manufactured by Cuesta Systems, Inc., 3440 Roberto Court, San Luis Obispo, CA 93401 (805) 541-4160.

Canadian distributors are:

ASAP Computer Products, 116 Viceroy Rd., Concord, ON L4K 2M9 (416) 738-0500.

Canada Mainframe Facilities, Matheson Mews, Ste. 18, 400 Matheson Blvd., Mississauga, Ont. L4Z 1N8 (416) 272-3390.

Compuspec, 801 4th Street, NE, Calgary, Alberta T2E 3S9 (403) 230-4040.

Dynamedia Inc., 5000 Buchan St., Ste. 304, Montreal, Quebec H4P 1T3 (514) 739-3183.

Frantek Software Distrib., 1685 Russell Rd., Unit 7, Ottawa, Ont. K1G 0N2 (613) 523-7272.

## Savers

PC Saver line cord is a portable surge suppressor for portable computers.

Price: \$49.95 U.S.

**Micro Saver** is a multi-outlet center with a built-in noise filter and surge suppressor.

Price: \$69.95 U.S.

**System Saver** filters out damaging AC line and noise and power surges. This peripheral is for your Apple IIe.

Price: \$89.95 U.S.

Manufactured by Kensington Microwave Ltd., 251 Park Avenue South, New York, NY 10010 (212) 475-5200.

No Canadian distributor.

Note for all of the Savers add \$2.50 U.S. for shipping and handling. Orders outside of the U.S. must be prepaid.

## Specialized Peripheral Interfaces

### Echo II

Echo II is a speech synthesizer for the Apple II. It has an unlimited vocabulary. It can be used for educational programs, games, assisting the han-

dicapped, phone answering, and business applications.

Suggested retail price is \$249.00.

Distributed by Unitron Computer Corporation, 6400 Millcreek DR., Mississauga, Ontario L5N 3E7 (416) 821-3380.

## Keytronic Keyboards

KB 5151 IBM PC Keyboard offers separate cursor keys, top row function keys with removable template, and a handy pencil and book holder ridge.

The suggested retail price is \$255.00 U.S.

Manufactured by Key Tronic, PO Box 14687, Spokane, Washington 99214 (509) 928-8000.

A Canadian distributor is Future Electronics, Downsview, Ontario (416) 638-4771.

## IRMAkey/3270

IRMAkey/3270 keyboard places all the functions of a 3270 terminal and a PC computer at the user's fingertips. IRMAkey/3270 contains all the keys found on a 3270 typewriter-style keyboard, as well as the keys found on a PC-keyboard.

Price: \$500.00.

Manufactured by Digital Communications Associates, Inc., 303 Technology Park, Norcross, Georgia 30092 (404) 448-1400.

Canadian distributors:

Logiquest, 555 Dorchester W., Suite 1616, Montreal, Quebec H2Z 1B1.

Software Research Corporation, Discovery Park, University of Victoria, PO Box 1700, Victoria, BC V8W 2A2.

Also available through Computerland stores throughout Canada.

## Net-488

Net 488 is a file transfer system allowing high-speed data transfer between computers sharing an IEEE Standard 488 bus. The Net 488 can be used for rapid transfer data among several computers in a single building.

Price \$2000.00 U.S. for the first system.

**GPIB-696** is a S-100 high speed DMA interface to IEEE-488 bus. It offers DMA compatibility, 300 K bytes/sec, compatible with many versions of the S-100 bus, and supports 24 bit addressing.

Price \$995 U.S.

**GPIB-696P** BX connectors for multifunction capability, and 8 or 16 bit I/O addressing.

Price: \$495.

**GPIB-SBX** is a multi-module interface to the IEEE-488 bus. It offers 250 K bytes/sec with host DMA, single wide card, and it turns GPIB-796P or GPIB-696P into multiport IEEE-488 interfaces.

Price: \$350 U.S.

Manufactured by National Instruments, 12109 Technology Blvd., Austin, Texas 78727 (512) 250-9119.

No Canadian distributor.

## Protalker

Protalker is a speech synthesizer for the IBM PC, IBM-compatible, and S-100 computers. Protalker combines a circuit board with software. The software allows you to record any sound and play it back.

The suggested retail price is \$349.00 U.S. for the IBM version, and \$399.00 U.S. for the S-100 version.

Manufactured by Speech Ltd., 3790 El Camino Real, Suite 213, Palo Alto, California 94306 (415) 941-2490.

No Canadian Distributor.

## Keyboard Buffer for Apple

The Keyboard Buffer speeds up your keyboard input in your Apple II, Apple II+ or compatible, by adding an additional 64 bytes of input buffer. It allows you to boot, load, run, list and print your program before the next screen appears.

Price: \$9.95 U.S.

Manufactured by Central Valley Electronics, PO Box 33102, KC, MO 64114 (816) 444-5215.

No Canadian distributor.

## Multiflex Apple Compatible EPROM Programmer

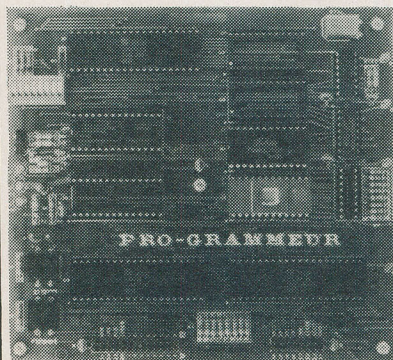
The Multiflex TEPROM Eeprom Programmer for Apple computers programs 2716, 2732, 2732A, and 2764. It also features a ZIF socket for EPROM and complete software and built-in programming voltage supply.

Price: \$69.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.

Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

## SELF-CONTAINED EPROM COPIER/PRO-GRAMMER



- Includes its own Z80-A processor
- Needs no personality module
- Copies: 1, 2, 4 & 8K bytes single supply EPROMs
- Comes with a powerful 4K bytes-monitor

ONLY \$99.00\* (kit)

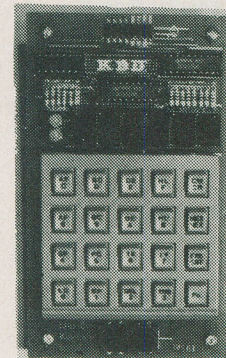
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With this KBH interface, you can modify your EPROM content or load a new code in the PRO-GRAMMER's RAM before transferring on EPROM. You can also access several operation modes such as:

- Memory and register examine and change
- Insert/delete one or many bytes anywhere in a program
- Break point execution mode
- Block transfer mode
- and much, much more

ONLY \$59.00 kit



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# Directory of Paraphernalia

## IBM Compatible Expansion Card

This IBM Compatible Expansion Card has options that allow the IBM user to save I/O expansion bus room by providing some popular options. The Basic Expansion Card includes 64K of RAM and is completely socketed for the other options.

Price for the Basic Expansion Card is \$199.00.

Price for the Options:

**RAM:** (for each extra 64K RAM, to a maximum of 256K total) \$85.00.

**Parallel and Game Port:** \$69.00

**Serial Port:** \$69.00

**Real Time Clock:** \$59.00

**Card:** (with all of the above (256K RAM), printer cables and software not included) \$599.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.

Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, (800) 268-3798.

## Parallel/Games Port

This board allows any IBM compatible printer to be connected to the system. This card is not only for printers, but can be used where parallel data must be transmitted from the system. The game port allows four paddles or two joysticks to be connected.

Price: \$149.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.

Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, (800) 268-3798.

## Tecmar Specialized PC Interfaces

**EPROM Programmer/Reader** allows you to program and to read EPROMs and EEPROMs. The expansion system provides 16 more sockets for individual or batch programming. The software has menu driven routines that enable the user to acquire, receive and manipulate data to program EPROMs or EEPROMs.

**Price for the E+EPROM Programmer/reader** is \$713.00, for the E+EEPROM Expansion \$857.00, and for the E+EEPROM Software it is \$123.50.

**The Video Cassette Recorder Controller** controls all remote functions on the SONY SC22500. It codes each frame so the user can locate any particular frame on the video tape.

Price: \$713. Note not available until November.

**The Speech Master** is for any application where verbal response has proven effective. The features include an onboard speaker with provision for external speaker or amplifier.

Price: \$569.00.

**The Device Master** is for the BSR X-10 unit. It turns electrical outlets on or off, and dims lights without any additional wiring. It uses no direct AC connection to avoid damage to the computer.

Price: \$353.00.

**The Stepper Motor Controller** gives you control of one or two stepper motors through the IBM PC. It will control four phase or pulse actuated motors.

Price: \$713.00.

**The Fourporter** was designed to provide easy access to connectors on multifunction boards. It provides mounting for four male or female DB25 connectors on back of IBM PC or Tecmar Expansion Chassis slot.

Price is \$137.00.

**Time Master** is a clock/calendar with five-year battery back up and software auto time function that automatically inserts date and time at 'power on'.

Price: \$194.00.

Manufactured by Tecmar, Inc., 6225 Cochran Rd., Solon (Cleveland), Ohio 44139 (216) 349-0600.

Canadian distributor is EMJ Data Systems, 291 Woodlawn Rd., Unit 3, Guelph, Ontario N1H 7L6 (519) 837-2444.

## PC Data Acquisition

The modularized data acquisition and control products are for the IBM PC. The products included in the family are: 8 bit A/D, 12 bit A/D, 8 bit D/A, and 12-bit D/A converter modules, and a parallel expansion board.

Price: 8-bit A/D converter system (parallel box-expansion board and 8-bit A/D module) is \$390 U.S. 12-bit A/D converter system (Parallel Expansion Board and 12-bit A/D module) is \$690 U.S.

Prices include LABSTAR software package.

**Multifunction GPIB Controller:** The IEEE 488 GPIB multifunction board for the IBM PC provides an interface between the PC and the GPIB compatible instruments for automated measurement and data acquisition applications.

Price: Multifunction GPIB controller is \$395 U.S. The software support package which includes IEEE488 controller and Data Acquisition driver's is \$100 U.S. Module prices range from \$75 U.S. to \$495 U.S.

Manufactured by Qua Tech Inc., 478 E. Exchange St., Akron, OH 44304 (216) 434-3154.

No Canadian distributor.

## Tecmar PC Data Acquisition

The Lab Master is a system that includes 16 channels of 12-bit A/D with a 30 KHz conversion rate, two channels of 12-bit D/A, five timer/counters and three 8-bit parallel ports.

Price is \$1432.00 for the basic unit.

**The Lab Tender** is designed for data acquisition and control applications, with 32 channels of 8-bit A/D conversion, 16 channels of 8-bit D/A conversion, five timers and three 8-bit parallel ports.

Price: \$713.00.

**The Base Board** is a digital input/digital output board with four sections of 24 DI/DO lines. Each section can be used as a standalone DI/DO interface or with a daughter board for prototyping.

Price: \$497.00.

**The Digital-to-Analog and Digital Input/Output** has four independent channels of 12-bit digital-to-analog conversion that can be double-buffered, with three 8-bit parallel ports.

Price: \$569.00.

Manufactured by Tecmar, Inc., 6225 Cochran Rd., Solon (Cleveland), Ohio 44139 (216) 349-0600.

Canadian distributor is EMJ Data Systems, 291 Woodlawn Rd., Unit 3, Guelph, Ontario N1H 7L6 (519) 837-2444.

## Tecmar PC IEEE488 Interface

The IEEE488 Interface enables the PC to operate as system controller or as an addressed talker/listener. A library of machine language subroutines called from BASIC or FORTRAN for data transactions with GPIB.

Price for the IEEE488 Interface is \$569.00, and for the software \$123.50.

Manufactured by Tecmar, Inc., 6225 Cochran Rd., Solon (Cleveland), Ohio 44139 (216) 349-0600.

Canadian distributor is EMJ Data Systems, 291 Woodlawn Rd., Unit 3, Guelph, Ontario N1H 7L6 (519) 837-2444.

## MODEMs and Telecommunications

### Arcnet Local Area Network

Radio Shack's Arcnet (Attached Resource Computer Network) is the high-performance local area network for TRS-80 computers, peripherals, software and information. You can link up to 255 model 12 and II computers.

Price for the Arcnet board is \$599.00, it includes applications processor software and user's guide. Does not include installation.

Manufactured by Radio Shack, Division, Tandy Electronics Ltd., Bayview Dr., Box 34000, Barrie, Ontario L4M 4W5 (705) 728-6242.

## Multiflex Apple Serial Card

Multiflex Serial Card allows you to select desired baud rate, and connect to a serial RS-232C modem, terminal or a serial printer port.

Price: \$99.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.

Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

## Hayes Smartmodem 300 and 1200

Smartmodems 300 and 1200 connect directly to telephone lines, have auto answer and auto dial, touch tone and pulse dialing, full or half duplex, speaker alerts you to busy signals or wrong numbers, and redial.

Smartmodem 300 operates at up to 300 bps and is compatible with Bell 103 modems.

Estimated retail price is \$289.00 U.S.

Smartmodem 1200 operates at up to 300 bps or 1200 bps and is compatible with Bell 103 and Bell 212A modems. It also has automatic speed selecting.

Estimated retail price is \$699.00 U.S.

Manufactured by Hayes Microcomputer Products, Inc., 5923 Peachtree Industrial Blvd., Norcross, Georgia 30092 (404) 449-8791.

Canadian distributors:

Compuserve, Suite 219, 1675 West 8th Ave., Vancouver, BC V6J 1V2 (604) 733-7783.

Compuserve, 3450 Drummond, Montreal, Quebec N3G 1Y2 (514) 844-9343.

Micron Distributing, 409 Queen Street West, Toronto, Ontario M5V 2A5 (416) 593-9862.

Compuserve, 606 Hood Road, Markham, Ontario L3R 3K9 (416) 477-8088.

## SAM 212A and SAM 201

SAM 212A is an auto-dial, auto-answer modem which is compatible with Bell 212A and 103 modems. It features auto-speed and parity select, in addition to auto-selection of tone or pulse dialing and more.

Price available on request.

SAM 201 operates over the public switched telephone network of 2- and 4-wire private lines. The SAM 201 features a built-in auto-answer and manual dial DAA for use in the public switched network.

Price available on request.

Manufactured by Gandalf Data Limited, 100 Colonnade Road North, Nepean, Ontario K2E 7M4 (613) 226-6500.

## TRS-80 Data Communications Modems

The modems are compatible with RS-232C equipped TRS-80. Bell 103, 300 baud, full duplex, originate and answer. Includes 120VAC power module.

**Acoustic Coupler AC-3** also has half duplex.

Price: \$249.00

**The Direct-connect Modem I** plugs directly into phone outlet. DB25 and 4-pin DIN connectors. Price: \$249.00

**The Auto-Answer, Auto-Dial DC Modem II** is fully programmable. It automatically dials and answers phone, receives and transmits data, hangs up phone and has half duplex.

Price: \$339.00

Manufactured by Radio Shack, Division, Tandy Electronics Ltd., Bayview Dr., Box 34000, Barrie, Ontario L4M 4W5 (705) 728-6242.



### IRMA PC to Mainframe Link

IRMAprint is a decision support interface. It allows asynchronous ASC II output devices to operate as output peripherals within IBM 3270 networks.

Price: \$1900.00

**IRMALETTE** is a decision support interface. This unit is a serial interface for the IBM PC, which when used in conjunction with the DCA's IRMALINE, provides remote IBM PCs with the same functions that IRMA offers to local IBM PCs.

Price: \$515.00

**IRMALINE** is a decision support interface that provides a link between PCs or asynchronous terminals and IBM 3270 controllers. This package also includes an on-board 3278/79 emulation program.

Price: \$1900 including documentation.

**IRMAcom** allows the IBM PC and compatible PCs to attach to networks using synchronous protocols over leased or switched lines. IRMAcom is intended for use with IRMAcom SNA and BSC communications software products.

Price: \$1450.00

Manufactured by Digital Communications Associates, Inc., 303 Technology Park, Norcross, Georgia 30092 (404) 448-1400.

Canadian distributors:

Logiquest, 555 Dorchester W., Suite 1616, Montreal, Quebec H2Z 1B1.

Software Research Corporation, Discovery Park, University of Victoria, PO Box 1700, Victoria, BC V8W 2A2.

Also available through Computerland stores throughout Canada.

### PerComNet Interface

The PN-IBM is the PerComNet interface card for the IBM PC.

PerComNet provides a means for interconnecting a variety of different microcomputer systems.

Suggested retail price is \$595.00 U.S. for the board.

Manufactured by Percom Data Corporation, 11220 Pogemill Rd., Dallas, Texas 75243 (214) 340-7081.

No Canadian distributor.

### Intellimodem for the PC

The PC: Intellimodem has integrated Voice/Data which allows switching between voice and data communications. It also has line status detection, auto monitor, and programmable status LED. The Intellimodem comes with PC: intellicom software package.

Price:

Manufactured by Bizcomp, 532 Mercury Drive, Sunnyvale, CA 94086 (408) 733-7800.

No Canadian distributor.

### Icebox

The Icebox 1 incorporates a 1200 baud modem, RS-232C A/B selector, tri-colour status and data

monitor LEDs, and integral 'null-modem' transfer switches.

Suggested retail is \$1195.

Manufactured by Artic Data Corporation, 1839 1st Avenue, Prince George, B.C. V2L 2Y8.

### The Networker

The Networker Modem package is for the Apple II, II+, IIe computers. This package contains; all of the hardware needed for communications, communications software, and a subscription to The Source information utility.

Price: \$179.00.

Manufactured by Zoom Telephonics, 207 South Street, Boston, Massachusetts 02111 (617) 423-1072.

Canadian distributors are:

Microcom, 2060 Trans-Canada Highway, Dorval, Quebec H9P 2N4.

Galleria International Trading, 3400 Midland Avenue, Unit 1, Scarborough, Ontario M1V 2M9.

### LocalNet 20

LocalNet 20 is a data communications network based on a synergistic combination of analog, digital and data communications technologies. LocalNet can support 20,000 communication users.

Price N/A.

Manufactured by Sytek Lan Systems Limited, 235 Yorkland Blvd., Suite 300, North York, Ontario M2J 4Y8 (416) 494-8200.

## THINKING ABOUT BUYING A MICRO COMPUTER SYSTEM?

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Toronto, Ont. (416) 964-9192

Computer House  
23 Westmore Dr., Unit #5  
Rexdale, Ont. (416) 745-4740



# Directory of Paraphernalia

## Multi-modems

There are three variations on the discrete MultiModems.

The most sophisticated is a superset of the Hayes 1200. There are also versions which are completely compatible with the Hayes 1200 and 300 modems.

Plug-in card versions of the modems are available for the IBM PC and the Apple IIe. The former features 1200 and 300 baud operation; the latter a choice of 300 and 110 baud.

Price for the three 1200/300 bps MultiModems is: \$549.00; for the MultiModem IIe it is \$329.00; and for the MultiModem HC3 it is \$289.00. All prices are in U.S. dollars.

Manufactured by Multi-Tech Systems, Inc., 82 Second Avenue S. E. New Brighton, Minnesota 55112 (612) 631-3550.

No Canadian distributor.

## 10-Net

10-Net is a local area network consisting of both hardware and software that allows PC to PC interaction. 10-Net operates on IBM PC's and compatibles.

Price N/A.

Manufactured by Fox Research, Inc., 7005 Corporate Way, Dayton, Ohio 45459 (513) 433-2238.

Canadian Distributor is Crown Tek, 3000 Steeles Avenue East, Markham, Ontario L3R 4T9.

## U.S. Robotics Modems

IBM PC Modem is an asynchronous modem that also adds 64K of memory to your IBM PC or IBM XT.

Price: \$575.00.

**Auto Dial 212A** operates unattended at 300/1200 baud, with programmable automatic dialing and answering.

Price: \$770.00.

**S-100 Modem** has 300/1200 baud speed, programmable auto dial, and auto answer capability, auto mode, auto speed select, auto line monitor, and more.

Price: \$575.00.

**Auto Link 212A** has the same operating features of Auto dial except programmable auto dial.

Price: \$705.00.

**Auto Link 1200** data transmission is at 1200 baud, full/half duplex, with manual originate and automatic/manual answer. It also has full diagnostics and switch selection.

Price: \$640.00.

**Micro Link 1200** transmits at 1200 baud, full/half duplex.

Price: \$575.00.

**Auto Link 300** is a 300 baud modem for handling incoming traffic unattended. Auto answer can be switched to manual.

Price: \$345.00.

**Micro Link 300** is a companion model to Auto Link 300 with manual answer only.

Price: \$310.00.

**Phone Link** is an acoustic modem that transmits at up to 300 baud, full/half duplex. It talks to any other Bell 103/113 unit though standard headsets.

Price: \$245.00.

Manufactured by U.S. Robotics, 1123 West Washington, Chicago, Illinois 60607 (312) 733-0497. Canadian distributor: Amies Inc., PO Box 1341, Pembroke, Ont. K8A 6Y6 (613) 732-7214.

## ELAN Local Area Network

ELAN is an Extended Local Area Network. There are three versions of ELAN. The secretary has an ethernet link, ethernet companion, and ELAN software. The Manager has an ethernet link, ethernet companion, Modem (300 Baud), and ELAN software. The Executive has ethernet link,

ethernet companion, modem (300 baud), voice recognition, a microphone, and ELAN software. The price of the Secretary is \$2440.00; the Manager is \$2873.00; and the Executive is \$4313.00. Please note these items are not available until November.

Manufactured by Tecmar Inc., 6225 Cochran Rd., Solon, OH 44139 (216) 349-0600.

Canadian distributor is EMJ Data Systems, 291 Woodlawn Rd., Unit 3, Guelph, Ont. N1H 7L6.

## IDEA LANs

IDEAshare and IDEAnet connect up to four IBM PCs/XTs by ordinary cable in star configuration. IDEAshare software consists of server and user diskettes.

Price for IDEAshare Resource \$545.00 U.S., for the IDEAnet interface card \$595.00 U.S., for the IDEAnet software \$1640.00 U.S., and for the IDEAnet Starter Kit \$75.00 U.S.

The IDEAcomm 3278 is a controller card for the IBM PC or IBM PC/XT provides linkage to IBM 3278 display controllers.

Price: \$995.00 U.S.

The IDEAcomm 1200 is a multifunction communication card for the IBM PC and the IBM PC/XT. The card provides asynchronous communications, data communications, and voice communications.

Price: \$495.00 U.S.

Manufactured by IDEAssociates, Inc., 7 Oak Park Drive, Bedford, MA 01730 (617) 275-4430.

No Canadian distributor.

## Integrated Applications Modems

The Mediator Serial and Parallel Port Adaptor provides parallel to serial, serial to parallel, and serial to serial data conversions. This is a stand alone device with its own internal power supply.

Price \$349 U.S.

**The Intercept** prevents unauthorized internal and external access on a synchronous communication lines.

Price \$595 U.S.

**The Mediator Remote Master Console** allows the local master console terminal to operate at full speed and the modem to be connected to the mux port of the computer.

Price \$495 U.S.

Manufactured by Integrated Applications, Inc., 8600 Harvard Ave., Cleveland, Ohio 44105 (216) 341-6700. No Canadian distributor.

## Comrex Modems

ComMunicator Modem is at 300 bps with auto answer, auto dial, and auxiliary phone connection.

List price of the CR-103 is \$259.00.

Manufactured by Comrex International, Inc., 3701 Skypark Drive, Suite 120, Torrance, CA 90505.

Canadian distributor is Epson Canada Ltd., 21 Progress Court, Unit 18, Scarborough, Ont. M1G 3V4 (416) 431-5588.

## Plotters

### FP-215 Flatbed Colour Plotter

The FP-215 draws using BASIC ASCII command codes and parameters. Text prints horizontally or vertically using BASIC LPRINT command. It is a single pen plotter, with four colour pens that can be interchanged.

Price: \$1399.00.

Manufactured by Radio Shack, Division, Tandy Electronics Ltd., Barrie, Ontario L4M 4W5.

### Comrex Plotter CR-1810

ComScriber I CR-1810 plots to a precision of .004". It is compatible with most popular personal

computers. It also includes Tutorial software, interface cable, 4 colour pens, and paper.

List Price is \$1029.00.

Manufactured By Comrex International, Inc., 3701

Skypark Drive, Suite 120, Torrance, CA 90505.

Canadian distributor is Epson Canada Ltd., 21 Progress

Court, Unit 18, Scarborough, Ont. M1G 3V4 (416)

431-5588.

## Printer Interfaces

### Print It! for the Apple II+

Print It! cards are parallel/serial graphics printer interfaces.

Print It! has it's own button which allows program interruption and resumption. Print It! model 2 has full software compatibility, printer support, and text formatting.

Price of Print It! with push-button is \$349.15, without push-button \$206.42.

Manufactured by Texprint Inc., 220 Reservoir St., Needham Heights, MA 02194 (617) 449-5808.

Canadian distributor is Frantek Software Distributors, Inc., 1685 Russell Rd., Unit 7, Ottawa, Ont. K2G 0N1.

### Parallel Printer Interface Card

The Multiflex Parallel Printer Interface Card with cable, plugs into any of the Apple II+ and IIe, or work-alike computers, and provides the user with a parallel interface capable of handling graphics and characters.

Price: \$69.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941.

Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### Grappler +

Grappler + is an interface card providing graphic screen dumping for the Apple II/II+/IIe/III computers. Grappler + gives the Apple user freedom of on-board printer selection. A quick dipswitch setting allows interfacing to most popular dot matrix printers.

Price N/A.

Manufactured by Orange Micro Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807.

Canadian distributor is Frantek Software Distributors Inc., 1685 Russell Rd., Unit 7, Ottawa, Ontario K1G 0N1 (613) 523-7272; 800-267-9700; 800-267-4014.

## Multifunction Cards

### TecmarPC Scribe Tender

The Scribe Tender has two asynchronous serial ports, status reporting, one parallel port and it is compatible with TI professional and COMPAQ personal computers.

Price is \$283.00 for the low level one.

Manufactured by Tecmar, Inc., 6225 Cochran Rd., Solon (Cleveland), Ohio 44139 (216) 349-0600.

Canadian distributor is EMJ Data Systems, 291 Woodlawn Rd., Unit 3, Guelph, Ontario N1H 7L6 (519) 837-2444.

### IDEA PC Interface Cards

The IDEAmimi is an I/O card for the IBM PC. It also offers you up to four options, such as parallel interface, one or two serial interfaces, or a clock/calendar/battery.

Price with one option \$220.00 U.S., with two options \$245.00 U.S., with three options \$270.00 U.S., and with three options and additional serial \$295.00 U.S.

**The IDEApus** is a combination card for the IBM PC. It can have memory expansion from 64 KB to 256 KB. It offers up to three options, such as



Parallel printer interface, or parallel Disk Interface, or a clock/calendar/battery. Prices range from \$320.00 U.S. to \$610.00 U.S. Manufactured by IDEAssociates, Inc., 7 Oak Park Drive, Bedford, MA 01730 (617) 275-4430. No Canadian distributor.

### Tecmar PC Multi-function Boards

The Captain has upgradable memory from 0-384K, clock/calendar, Pal serial port, parallel port, ramspooler, speed disk and auto-time. Price for 64K: \$560.00.

The 1st Mate is the same as the Captain but it has 64K of addressable memory. Price for 0K is \$459.00.

The 2nd Mate has 2 serial ports, 2 parallel ports, clock/calendar, and Pal. Price: \$641.00.

The 3rd mate has an on-board modem and I/O options. It also has dialing supported with no external cables or wiring. All you need is a phone jack.

Price: \$641.00. Note not available until November.

Manufactured by Tecmar Inc., 6225 Cochran Rd., Solon, OH 44139 (216) 349-0600. Canadian distributor is EMI Data Systems, 291 Woodland Rd., Unit 3, Guelph, Ont., N1H 7L6.

### Chipmunk IBM Multifunction Card

The Chipmunk is a 4 function card, comprising a parallel port, clock/calendar and Chipdisk software. Price N/A.

Manufactured by Orange Micro Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807. Canadian distributor is Frantek Software Distributors Inc., 1685 Russell Rd., Unit 7, Ottawa, Ontario K1G 0N1 (613) 523-7272; 800-267-9700; 800-267-4014.

### STB PC Multifunction Card

STB PC Multifunction card — up to 384K of memory plus an asynchronous RS-232C serial communications port, a second serial port, a parallel port, and a battery operated clock/calendar and a game port.

Price: \$95.00 U.S., optional second serial port \$49.95 U.S.

The Super Rio is a multi-function card that adds two serial ports, a parallel port, a game port, a battery-backed clock/calendar and up to 768 K RAM.

Prices range from \$249.00 U.S. to \$879.00 U.S. STB Super I/O combines the serial, parallel and game ports, plus a battery-backed clock/calendar and software utilities for print spooling and memory disk support.

Suggested Retail \$229 U.S.

Manufactured by STB Systems Inc., 601 N. Glenville, Suite 125, Richardson, Texas 75081 (214) 234-8750. No Canadian distributor.

## Memory Expansion

### STB PC Memory Expansion Board

STB 64K Memory Expansion Board starts with 64K of RAM and is upgradeable in 64K increments to 384K.

Suggested Retail for the STB 64K board is \$295.00 U.S.; for the STB 256K board: \$565.00 U.S.; and for the STB 384K board: \$745.00 U.S.

Manufactured by STB Systems, Inc., 601 North Glenville, Suite 125, Richardson, Texas 75081 (214) 234-8750.

No Canadian distributor.

### Multiflex 256K RAM Card

The Multiflex 256K RAM card provides the user with up to 256K of dynamic RAM. Refresh of

RAM can be handled externally, wait-states can be jumper selected, compatible with CP/M and CP/M operating systems, bank select feature, and write-protect option.

Price of the complete RAM Card with 64K of RAM is \$249; with 128K: \$319; and with 256K: \$439.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941. Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### Multiflex S100 64K Static RAM Card

The Multiflex S100 64K Static RAM Card uses 2K x 8 static RAM chips. Static RAM eliminates problems with refresh. It also offers an optional battery back-up.

Price for complete board with 4K RAM is \$99; for 16K RAM is \$170; for 32K RAM: \$250, and for 64K RAM: \$399.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941. Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### Apple Memory Cards

The Multiflex 16K RAM Card expands your 48K Apple II+ to 64K. The Multiflex 16K RAM Card allows other languages to be loaded into your Apple from disk or tape.

Price: \$59.00.

The Multiflex 128K Memory Card can be used to function as RAM disk with your Apple. Software not included.

Price \$239.00 with 128K of RAM on-board; \$169.00 with 64K of RAM on-board.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941. Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

## Games, Paddles and Joysticks

### PRO Joysticks

The PRO 1000, 3000, and 5000 all work on the most popular video game/computer systems, with special models available for Texas Instruments and Coleco systems as well.

Price N/A.

Manufactured by Coin Controls, Inc., 2609 Greenleaf Ave., Elk Grove, IL 60007 (312) 228-1810.

Canadian distributor: Frantek Software Distributors Inc., 1685 Russell Rd., Unit 7, Ottawa, Ontario K1G 0N1 (613) 523-7272; 800-267-9700; 800-267-4014.

### EZ Port II

EZ Port II is an extension cable for the game I/O port of the Apple II computer, providing two ZIF sockets. Switch selectable paddle (0) and paddle (1) from socket A or B.

Price: \$34.95.

Manufactured by Versa Computing Inc., 3541 Old Concho Rd., Suite 104, Newbury Park, CA 91320 (805) 498-1956.

No Canadian distributor.

### Joysticks

These Colour Computer joysticks have 360 degree movement. They also have a single shot button.

Priced at \$29.95 a pair.

**Colour Mouse** This colour mouse adds speed to game playing and to creating colour graphics. It may be used alone or with one joystick.

Price: \$69.95.

Manufactured by Radio Shack, Division, Tandy Electronics Ltd., Barrie, Ontario L4M 4W5.

## Co-processors

### Multiflex Upgraded Z80 Card

The Multiflex Upgraded Z80 card allows the user to run Z80/8080 programs on their Apple II+ or IIe computer. It allows the user to run the CP/M operating system with all its attendant software (CP/M software not included).

Price: \$59.00.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941. Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### Multiflex Z80-64K Card

The Multiflex Z80-64K Card provides you with the functions of a Z80 card, along with an extra 64K of self-contained memory, on top of the existing memory in your Apple computer. Software not included.

Price given on request.

Manufactured by Exceltronix, 319 College Street, Toronto, Ontario M5T 1S2 (416) 921-8941. Exceltronix, 217 Bank Street, Ottawa, Ontario (613) 230-9000, 800-268-3798.

### AD8088 Processor Card For The Apple

The ALF's Processor Card adds an 8088 processor chip to your Apple II or compatible. It allows the 8088 and the Apple's 6502 to both run simultaneously, more than doubling the processing capability.

Suggested list price is \$345.00 U.S.

Note for orders outside of the U.S. advance payment, and detailed customs instructions are necessary.

Manufactured by ALF Products Inc., 1315F Nelson St., Denver, CO 80215 (303) 234-0871.

### PDQ Super 32 System

The PDQ Super 32 System is a 32-bit coprocessor and multifunction system which increases the processing speed and capabilities of Apple II and Apple IIe series computers.

Price: \$995.00 U.S.

Manufactured by Enhancement Technology Corp., PO Box 1267, 100 North Street, Pittsfield, MA 01202 (413) 445-4219.

No Canadian distributor.

## Music

### PVI Drum Key Card

The PVI Drum Key card can be plugged right into your Apple. It also allows you to edit the patterns individually. The software included is not copy protected, which allows you make more copies.

Price is \$140.00 U.S.

Manufactured by Peripheral Visions Inc., Great Valley Parkway, Malvern, PA 19355 (215) 647-3930.

### MC1 and MC16 Music Cards

The ALF's model MC1 and model MC16 Music Cards are for your Apple II, II+, IIe, Basis 108, Franklin Ace, or similar computer. The MC1 has nine independent voices and the MC16 has three voices per card. The MC16 has an eight octave range and 256 volume levels/voice. MC1 is used for music entry and playback, the MC16 is suitable for scientific use as well.

Suggested list price for the MC1 is \$169.00 U.S.; for MC16: \$179.00 U.S.

Note for orders outside of the U.S. advance payment, and detailed customs instructions are necessary.

Manufactured by ALF Products Inc., 1315F Nelson St., Denver, CO 80215 (303) 234-0871.

CNI!



# COMPUTER PRESS

## Franklin Chapter 11

Franklin Computer Corporation has filed for reorganization under Chapter 11 of the United States' Bankruptcy Code just two days after having laid off 160 of its 275 plant employees.

The filing will give Franklin time to work out a strategy — protected by the courts from creditor court ac-

tion — to continue operations and to pay its bills.

Franklin Computer Canada (independent from the American corporation) is still operational, though president Paul Gastman was quoted in *PRINTOUT* as stating they've "...definitely had problems getting product from Franklin."

## TRW Security Breach

MELVILLE, NEW YORK — 'Hackers', through illegally obtaining an account code and password to **TRW Information Services'** computer system have accessed the *online credit reports* of a Sears, Roebuck &

Company account.

A system manual listing sensitive information including user ID's was stolen from TRW, the United States' largest credit bureau, and copies were distributed to interested unauthorized parties.

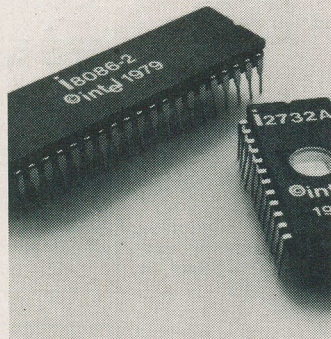
The accessed account was shut down when the breach was discovered.

## Corona Price Cuts

WESTLAKE VILLAGE, CALIFORNIA — In reaction to IBM's recent retail price review on its microcomputers and hardware, **Corona Data Systems** has announced a general restructuring of their pricing as well.

The cuts range from 11 percent to over 20 percent on Corona microcomputers and vary from 22 to 34 percent on hardware.

Scarsdale Technologies, of Don Mills Ontario is Corona's Canadian Distributor.



## IBM PC Tablet I/O

WALTHAM, MASSACHUSETTS — *Scarsdale Technologies* of Don Mills, Ontario were announced as the exclusive Canadian distributors of Pencept's **Penpad 320** smart graphics tablet.

When connected to the IBM PC or compatible system, the Penpad tablet combines the capabilities of a keyboard and a mouse into one input tool. In digitizer mode, the tablet provides a resolution of 200 points per inch on its 11 by 11 inch active writing area.

Penpad works unmodified with Lotus 1-2-3 and WordStar, and several software utilities are included to make the pad easy to use with most off-the-shelf software.

For further information, contact Mr. Nick Lawley, Scarsdale Technologies, Inc., One Scarsdale Road, Don Mills, Ontario M3B 2R2 (416) 441-1900

## Software Author Opportunities

CARSON, CALIFORNIA — **GMS Software**, a full-service software and peripheral distributor for microcomputer products is evaluating **new micro-computer software products** for marketing and distribution to their dealer network.

Software GMS is already marketing includes InfoGraph 100 for the Digital Rainbow, InfoGraphics for the IBM PC and Bottomline V for most CP/M and MS-DOS systems.

Interested software authors can contact Mr. Tom Fadgen at GMS Software, 113 East Savarona Way, Carson, California 90746 or call (213) 217-0161.

## Mortgage Program Fix

COMPUTING NOW! — The *Monthly Amortization Chart*, an MBASIC program that appeared in both *Computers in Small Business* and the September 1983 issue of *Computing Now!* had more bugs in it than an ant farm.

Captain Boissonneault of Nepean, Ontario has **re-written the listing**, and we're making it available free to anyone sending us a self-addressed stamped envelope.

## Next Month In Computing Now!

### The Good Host

It's very often the case that one wants to have a second terminal into one's computer. This allows you to operate the system from someplace else, or to have two or more operators having access to the same system. Unfortunately, host programs, the software to do this, are very expensive and highly weird. They won't be after next month, though.

### Survey of Systems

Next month will mark the fourth running of the *Computing Now!* computer marathon, on the occasion of which we gather up all the systems available in Canada, and let them all run like mad slaving fools for about eighteen pages or until they pass out. If you are thinking of buying a system, or just want to keep up with what's available, you won't want to miss this survey.

### Apple Cards

Next month we'll be having a look at an assortment of the available low cost Apple compatible peripheral cards which have cropped up over the summer. Some of these things are pretty neat... and some are highly Martian. Knowing what to get... and what you're getting yourself in for... is a large part of the circus.

### Flotsam and Floobydust

There's a pile of things that you can do to make your computer work a bit better and a bit more cost efficient. There are also a number of corners better left uncut, lest the night-eyed creatures within be loosed to run insanely through your office leering at the secretaries. Next month we'll be looking at ways to save time, money and brain damage in using a business system.





## Mac Developers' School

CUPERTINO, CALIFORNIA — Independent Macintosh hardware developers and software authors who have signed up with Apple Computer's Certified/Registered Develop-

ers' program can elect to enroll in the *Macintosh Software Mill*.

Open 24 hours a day, the school provides technical know-how and consultation, as well as the materials necessary to prepare a developer's brainchild for distribution.

The Software Mill is located at Apple's main offices in California.

**Addresses:** Commodore Business Machines Limited, 3370 Pharmacy Avenue, Agincourt, Ontario M1W 2K4 (416) 499-4292 • Alta Systems, Inc., P.O. Box 9802, Suite 181, Austin, Texas 78766 (512) 836-7351 • T.W. Wilson Sales, 2652 Slough Street, Mississauga, Ontario L4T 3T2 (416) 677-8200 • DeskTop Software Corporation, 228 Alexander Street, CN-5287, Princeton, New Jersey, 08540 (609) 924-7111 • Tandy Electronics Limited, Radio Shack Division, 279 Bayview Drive, Barrie, Ontario L4M 4W5 (705) 728-6242 • Andent, Inc., 1000 North Avenue, Waukegan, Illinois 60085 (312) 223-5077 • Digital Signature, 5453 S. Woodlawn, Chicago, Illinois 60615 (312) 324-6533 • Trillium Corporation, Spinnaker Software, 1 Kendall Square, Cambridge, Massachusetts 02139 (617) 494-1200 •

*Commodore Business Machines Limited* has announced a new business applications personal computer with integrated software. The **Commodore 8296** features 128K RAM, an 80 x 25 display monitor, a 1.05 megabyte hard drive, and Paper Clip, CalcResult and Oracle Consultant as part of its built-in software...

Circle No. 60 on Reader Service Card.

A collection of useful utilities for the IBM PC, **PC Toolbox** gives Charlie's choice an extended directory, the ability to list text files to line printers, a continuous time display, dynamic monitor display switching, and a file utility. The program is produced by *Alta Systems, Inc.*...

Circle No. 59 on Reader Service Card.

Physicians and dentists with Apple II computers may benefit from *Andent, Inc.*'s **Dental**

**Medical Office Data** database system. The system consists of 13 programs including a mailing list, appointment scheduling, a text editor and a user-definable data base...

Circle No. 58 on Reader Service Card.

**Maxi-Switch Series 8500** IBM PC compatible keyboards, offered in standard, enhanced and Dvorak formats are being distributed in Canada by *T.W. Wilson Sales*. An 83 key version for the PCjr is also available...

Circle No. 57 on Reader Service Card.

A relational database system has been released by *DeskTop Software Corporation* for the Apple Macintosh computer. **1stBASE** provides multiple file capability, user defined file formats, nested sorts of up to 10 keys and allows the use of all Macintosh editing features...

Circle No. 56 on Reader Service Card.

Continued on pg. 82

# EPSON QX-10

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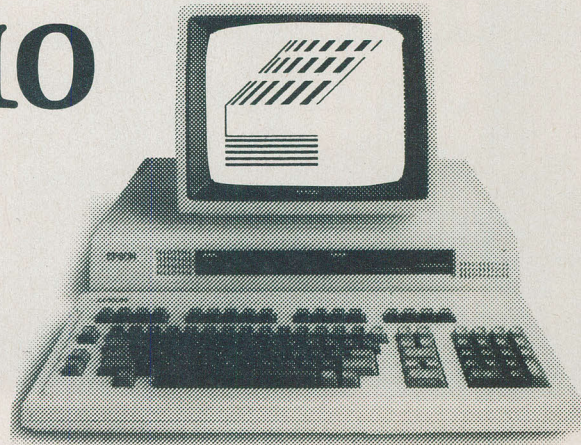
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# Xerox Service Centres



**It's powerful... it's shiny... it's the state of the art... and it's fried like a fish. A dead computer isn't even particularly edible... unlike a real fish. There's only one thing for it, then... you have to get it fixed.**

**by Larry Heintzman**

**"P**eople often ask what's the most reliable computer," says Brian Biggings, central operations manager for Xerox Service Centres. "I don't know. Everything I see is broken."

Xerox Canada, which for some reason has kept a low profile in personal computing, has recently produced an offspring which is becoming an integral part of the micro computer industry, the Xerox Service Centres. If you should be plagued by smoking disks or blazing mother boards, Xerox is ready to help, even if your system is not a Xerox product.

Since the idea got rolling about a year ago a dozen store front operations have opened across Canada. The Toronto shop, one of the busiest, has outgrown its present location and is looking for another site. New centres are opening at a rate of one or two a month.

## **No Duplications**

According to the service centres' national operations manager Domenic Constantini, the company has been flooded with requests for franchises. No less than a hundred and twenty dealers lined up at last year's Computer Fair in Toronto. The main technical centre in Dallas is kept busy deciding whose machines will be accepted.

By the end of the year Xerox expects to open new centres in Victoria and Regina, plus three more in Eastern Canada and one more in Ontario. It also expects to welcome a host of additional brand names including Altos, Compupro, Direct, Kaypro, NEC, Tallgrass and Unidata.

For manufacturers the advantages are obvious. Tim Barnes, sales manager for Semi Tech Microelectronics Corporation, sums it up simply as national coverage. Semi Tech produces the Pied Piper and is about to launch a new machine, also supported by Xerox. Semi Tech hopes that the association will boost user confidence and help sales.

Customers can use the centres in four different ways. One can pay an hourly labour charge plus parts to have a wayward machine put right. Those with forethought... or paranoia... can opt for an annual contract with a choice of carry in, pickup and delivery or on site service for one all inclusive fee. Besides maintenance, Xerox will also honour warranties and do manufacturer sponsored upgrading.

A few caveats are probably in order, however. As a spokesman for CGE, one of Xerox's competitors warned, price comparisons can be misleading since they don't, by themselves, tell customers what they're





# Almost Free Software Volume III

The two Almost Free Software Disks which we have been offering to our readers have been so enormously popular that we've created a third one. This disk has yet another double handful of useful routines, utilities and games selected from among the best of the public domain.

The Almost Free Software Disk Three contains:

**OIL** This is an interesting simulation of the working of the oil industry. It can be approached as either a game or a fairly sophisticated model. It features on line instructions.

**@** This is a very small program called an expression evaluator. It's like a calculator you can call up from the command line of your system, except that it can do all of the evaluation one normally gets in a large BASIC. It gives you answers in both decimal and hex.

**CHESS** This program really does play a mean game of chess. It has an on screen display of the board, a choice of colours and selectable levels of look ahead. You can castle and capture en passant. It's capable of beating the pants off even a fairly accomplished chess player.

**DBL** Printing a long document takes a lot of paper . . . a drag, this. DBL will put your printer into its condensed mode and print your text in two thinner columns side by side. It can also print starting anywhere within a file.

**DEBUG** The DDT debugger is good as far as it goes, but this package is a great deal better. It offers heaps of facilities that DDT can't and does symbolic debugging . . . it's almost like being able to step, trace and disassemble through your source listing.

**DU87** The older DUU program, despite its facilities, does have some limitations. This version overcomes them all and adds some valuable capacities. It will adapt byte on a disk. You can search, map and dump disk sectors or files. It's invaluable in recovering damaged files, too.

**ELIZA** This classic program is a micro computer head shrinker . . . as well as being a likely contender for the Turing intelligence test. It runs under MBASIC, and, with very little imagination you will be able to believe that you are conversing with a real psychiatrist.

**LADDER** This is . . . this program is weird. It's Donkey Kong in ASCII. Imagine yourself as a lower case "p" scrambling around ladders of H's. It's fast, bizarre and good for hours of eye strain.

**QUIKKEY** Programmable function keys allow you to hit one key to issue a multicharacter command. This tiny utility allows you to define as many functions as you want using infrequently used control codes and to change them at any time . . . even from within another program.

**RESOURCE** While a debugger will allow you to disassemble small bits of code easily enough, only a true text based disassembler can take a COM file and make source out of it again. This is one of the best ones available, loaded with sophisticated features to assist the user in this tricky undertaking.

We can provide volume three of the **Almost Free Software** in a wide variety of disk formats, to wit:

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\*single density formats require two disks. The package cost for these formats is \$19.95

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**Fine print:**

All of the software on the Almost Free Software volume 3 disk has been obtained from public access bulletin boards and is believed to be in the public domain. The price of the disk defers the cost of reproducing the software and mailing it plus the cost of the medium. . . the software itself is offered without charge.

Moorshead Publications warrants that the software provided will be readable. If defects in the medium prevent this, we will replace your disk. While we have made every effort to ensure that these programs are debugged, we are unable to assist you in adapting them for your application.



# Xerox Service Centres

getting for their dollar. CGE tends to quote between twelve and fifteen percent of the original purchase price for a one year, on site contract. Nor do customers always have a free choice; you can't take your ailing micro into just any depot. Lanpar, for example, also handles Eagle and Texas Instruments, neither of which is serviced by Xerox.

Those qualifications aside, a few facts stand out. First, "reasonable rates" are pretty much a state of mind. Service is expensive no matter who provides it. Second, based on the hourly rate plus materials, a single repair could easily cost as much as an entire year's contract. Apart from printer breakdowns, the most frequent problems handled by Xerox are disk drive alignments, miscellaneous dirt and a surprising number of motherboard failures costing upwards of a thousand dollars to fix without a contract.

There are also occasional bargains to be found. Xerox has been running a sale on two year Osborne contracts and special promotions, such as free memory expansion, are being considered for other models.

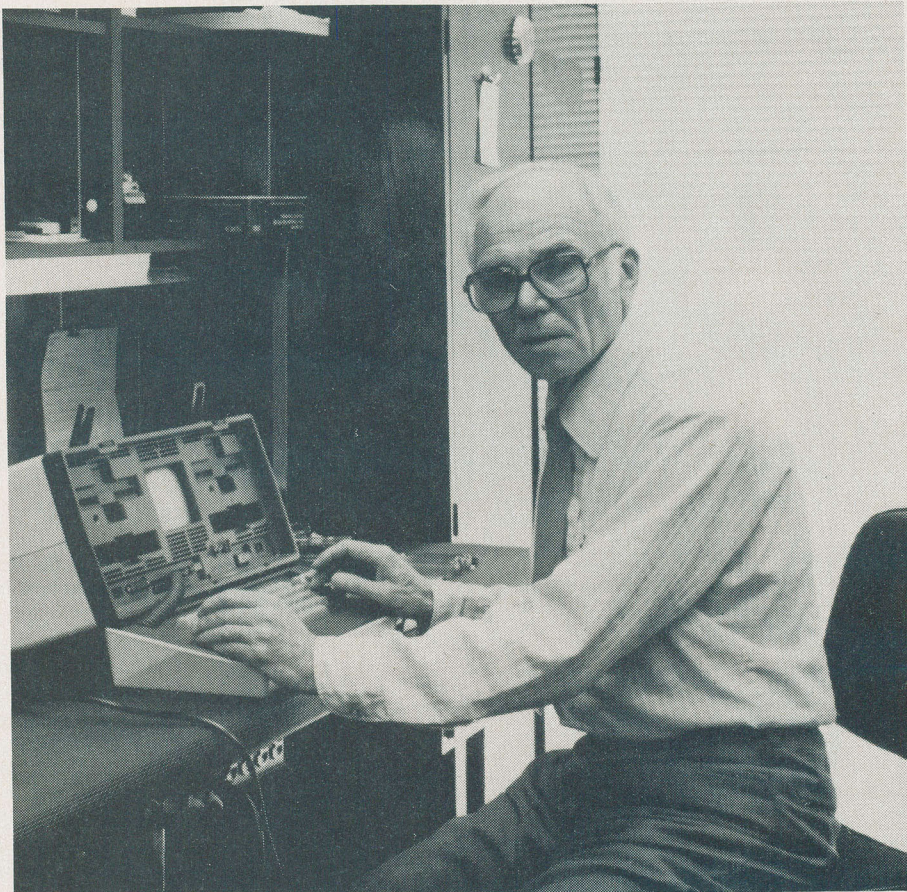
## Colour Copies

The Xerox Service Centres are like a company within a company. They have their own management, staff and payroll and can act with the speed of a small retailer. At the same time, they can take advantage of Xerox's massive international resources.

Training for the centres' technicians is conducted with the full cooperation from the allied manufacturers who, in some cases, are paying Xerox to develop documentation for them. Once the manuals are written in Dallas they're sent to the education department in Leesburg, Virginia and translated into self paced training courses. There are then distributed throughout the service network.

Before technicians touch a customer's machine they must also pass hands-on practice sessions where common problems are simulated. Manufacturers' representatives often sit in on these to make sure that everything goes by the book. In addition, Xerox has a full time trainer who travels the country keeping technical staff up to date on any changes.

The Xerox network can be a real advantage to customers who need speedy service. While every Centre stocks at least one set of parts for each of the systems it will repair, it's also linked to a computerized inventory system that can locate items in any of the other shops or at one of three regional distribution centres or at the national parts



depot in Mississauga. If all else fails, parts can usually be delivered from the States within a day.

The aim is same day service although Xerox is reluctant to guarantee a minimum delivery time. Brian Biggings, who oversees the Toronto Centre, says he's never had a shop repair take longer than eight hours. On site service might be slower by as much as two or three days, depending on when a visit can be scheduled and the distance from the nearest Centre. Biggings suggests that when speed is crucial, pickup and delivery is the best option.

The service centres will honour their contracts anywhere in Canada that there's a centre to drag your decimated hardware to. Every contract comes complete with a little plastic card called the Xerox Service Centre maintenance agreement. If you happen to get off a plane in Vancouver with a machine that doesn't work the way it did in Halifax, your career can still be saved. Just haul the thing over to the local Xerox Centre, wave the card and the gremlins will be exorcised while you stand by. This service will soon be expanded so Canadians can use their cards in the U.S. as well.

Xerox sees itself as supporting dealers, rather than competing with them. In fact it estimates that hundreds of dealers are actively promoting Xerox contracts. They get a commission, the assurance their customers will be well looked after and freedom from the expense of setting up their own service departments. Xerox also offers the option of working as a silent partner, so your machine could wind up at a Xerox Service Centre even if the dealer who sold it to you accepts it for service.

## Dead Chips

To its credit, Xerox is offering impressive resources at competitive prices and everybody from traditional corporate customers to single machine users is invited to take advantage of them.

Contemplating the demise of your machine might be painful, especially if your funds are limited, but sadly computing costs rarely end with hardware and software. Some day your pet tube is probably going to crash. For the humble and well heeled alike, the Xerox Service Centres are well worth thinking about.

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# Harbourfront



**If you head South from mid-Toronto and stop just before you plunge into the lake you'll probably encounter Harbourfront. Far more than just another amusement park, Harbourfront now offers, amongst other things, a computer centre.**

**by Frank Lenk**

**T**oronto's Harbourfront computer centre is an innovative way to learn about computing. In fact, it may be about the best way... especially if you're still at the stage of dabbling your toe in the water before taking the icy plunge.

There are two reasons for this. First of all, the centre has a basic mandate to wet no higher than maybe your ankles... it splashes one at an introductory level and no more. Secondly, it performs this baptismal function with more than average grace and dispatch.

However, the Harbourfront service is not without considerable relevance to the more experienced computer user. If you think about it, even if you are surrounded by micros and know their very souls on a first name basis there are probably a few areas you'd like to get into. Perhaps there's a type of machine you haven't played with yet, or a fancy piece of software you want to try before you slide out your American Express gold.

The Harbourfront centre is a painless introduction to micro computing for anyone who doesn't want to be buried in the dust of the ages. It's a great deal cheaper than the approach of simply buying machines 'til you find one you like and slightly quicker. It fairly seethes with helpful, knowledgeable staff and information.

## **By The Water**

You probably need a quick tour of the Harbourfront centre to get you into the functions of this unique facility.

The Computer Centre is housed in a moderate expanse of office type space, looking out onto one of the atria in the Harbourfront Queen's Quay terminal building. Within this posh milieu are housed some sixty-three microcomputers of numerous types.

The Centre presently owns over a dozen Hyperion IBM compatibles, almost as many Olivetti M-20 units, one real IBM PC, a DEC Rainbow, a TI Professional, a Pied Piper, four Osborne I's, five ICL's and a partridge in a pear tree. Sorry... that last one's still on back order.

For less business oriented work there are ten Apple II's, one Apple III, almost a dozen Commodore 64's and five Atari 800's.

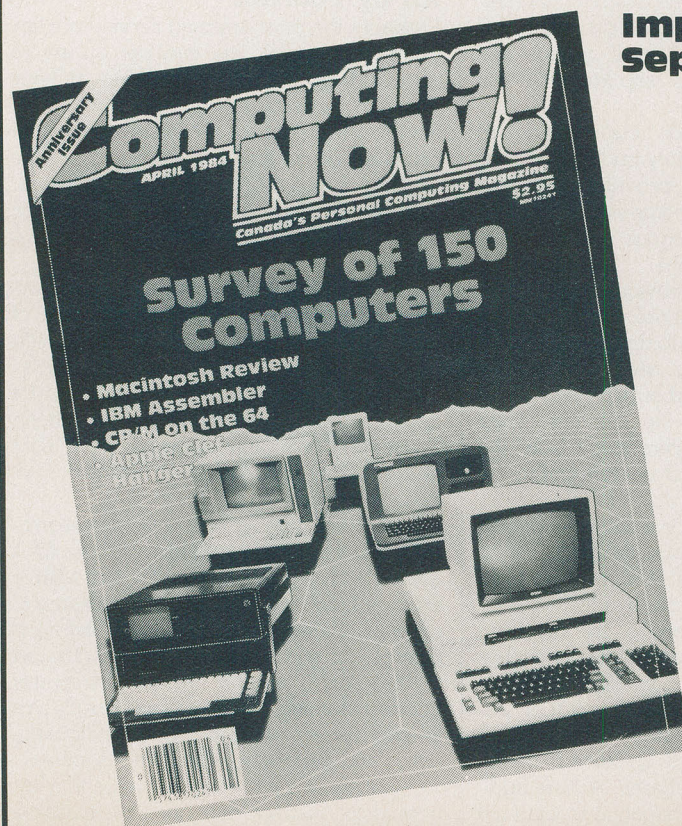
Oddly enough, none of these machines have required the outlay of massive amounts of cash. All have been donated by the suppliers. As the Harbourfront literature puts it, "the Centre in turn provides these companies with a showcase where people can learn to use their computers in a relaxed, non-threatening environment." What





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## Important Information About the September Issue of Computing Now!

Most computer magazines try to keep their readers informed about what's going on in the rapidly changing world of microcomputers. Computing Now! goes beyond this by providing not only information for computer users, but also applications and solutions to problems. Computing Now! is the only Canadian microcomputer publication which helps its readers find interesting and profitable uses for their systems. It speaks to a wide range of computer owners right from beginners just getting into their 64's on up to business users and seasoned programmers applying the latest sixteen and 32-bit technology.

The September issue of Computing Now! will feature the same diversity which has made CN! the largest selling Canadian computer magazine. Look for the bi-annual survey of all microcomputer systems, covering up to 200 of the computers available in Canada.

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# Harbourfront

this means is exposure, learning, but no selling, hard or soft.

According to manager Stan Squires, the Centre attempts to maintain a cross section of the popular models. The heavy reliance on Hyperion equipment results from a desire to support Canadian enterprise as well as from a healthy appreciation for the merits of the machine.

As for the software, Harbourfront reports that it has managed to acquire everything, about fifteen thousand dollars worth of purchases, plus miscellaneous donations. This obviously includes the stock business stuff like dBASE II, WordStar, Multiplan, Lotus and so on. It also includes most of the common languages... and some that are not so common, such as COMAL... plus rafts of educational software. Many of the Centre's machines were supplied complete with software packages.

## In The Drink

The real question is, of course, what does one do with all this paraphernalia...

This question relates back to the fundamental question of exactly what a computer centre is supposed to be. Harbourfront has concocted its own answer. Its aim is to "introduce and improve computer literacy for all age groups," to "provide a hands on... program to the public, without being a school."

Naturally, the Centre is directed primarily towards structured courses. This year's spring program offered fifteen different courses, of varying length and pitched at various levels of age and ability.

The most popular single course is also the thematic centrepiece of the program "Introduction to Micros." It starts every month, runs four two-hour weekly sessions for classes of about eight students and costs seventy cents a head. Its coverage includes BASIC, LOGO, graphics, word processing, spreadsheets and databases and runs the gamut of assorted brands of hardware. Exiting this, the average potential computer user should have a pretty good idea of what all the fuss is about with these newfangled electronic confusers.

There are also more specialized courses. For example, one could catch a six week treatment on the wonders of programming in BASIC. Or, if one wished to be different, there's a five week intro to COMAL, the Danish wonder language for the Commodore 64.

Many other courses are broken up by age and interest groups. Two courses address pre-schoolers, both running for fifteen weeks and thirty-three skins, one with



parental involvement and the other without. Based on Apple, Atari and some Commodore 64 software, these courses are "designed to develop the child's concentration, shape and recognition skills, math and pre reading abilities." Small groups and short half hour sessions help keep the little tykes on track.

Also fifteen weeks, but running to longer sessions and eighty bucks is an after school plan. This one provides a ground level introduction to computers and then progresses to more serious programming and business applications.

The Centre also provides school class visits. Or, for a mere three dollars a head, you can get the Centre to throw a computer birthday party. If you need longer term relief there are also Harbourfront day camp programs throughout the summer. They even pry the ankle biters away from the CRT every so often and get 'em out in the sunshine.

Of general appeal is a six week course in computer graphics and imaging. This is essentially an adult treatment, ranging from artistic masterworks to pie charts.

At the advanced end of the spectrum there are several programs of heavy professional computer instruction. The "Introduction to Business Applications" is a four session overview of essentials such as Multiplan, word processing, office management systems and databases. A new addition to this area is "Introduction to On Line

Database Use", which covers InfoGlobe, MarketScan and other systems.

## All By Yourself

Probably the most amazing service of Harbourfront is what you can get on an individual basis. For eighteen dollars an hour you can have one to one instruction on anything the Centre has available. For eight cents an hour, you can access any of the facilities if you bring your own software. You can use the centre's stuff for an extra ten spot... they'll have someone keep an eye on you.

Even this does not exhaust the Harbourfront repertoire. The true measure of the Centre's success is the overwhelming demand for its "custom" group services. This includes off site intensive courses for personnel within companies and institutions. The most popular item in this line is the eight hour one day introduction to business computing.

Collaborative efforts are also significant. The Centre makes its facilities available to all interested groups that wish to arrange their own instruction. For example, courses offered by the Toronto Skills Exchange group are often held in the comfort of the Centre on the Centre's hardware. Business training outfits also use the Centre as a convenient place to conduct their intensive... and generally expensive... seminars.

Collaboration means that some non-introductory courses can become available



through the Centre. The best example so far is a three day workshop on machine language programming. Kem Luther, an instructor at Sheridan College, has expanded his two day course, which he continues to teach at the College, and has proved incredibly popular at Harbourfront.

### The Long View

The Harbourfront Computer Centre is not the only computer literacy factory in the Toronto area, but for an introductory level operation it does seem to be the classiest. Its working hours are 9:00 am to 9:00 pm during the week and 9:00 am to 5:00 pm on the weekend. In an average week the Centre handles about a hundred pre-schoolers, eighty kids after school, four in-school classroom visits and two birthday parties. All the day camps are pretty well filled up with about a hundred and forty children.

Similar statistics pertain to the adult courses. The entire Centre is booked for three days in each of May and June and four days in October, for conferences involving around seventy people each.

There are also a few foreign dignitaries. So far, this has included visitors from Australia, New Zealand, England, Israel and the Netherlands. Stan Squires reports that the UK seems more advanced than Canada as far as real computer education, but it still lacks the equivalent in introductory centers like Harbourfront. The United States is taking a typically free enterprise approach. The *Computertown* chain, originated in the late seventies in California, is now franchising outlets across the country.

A number of other computer literacy centers are now in operation across Canada. According to Squires, Regina Plains Community College is probably the closest in spirit to the Harbourfront Centre.

There are also numerous local libraries running their own small literacy programs. In fact, that's just how the Harbourfront Centre got its start... the project began at the Oakville Public Library. In 1979, Squires, then Director of Childrens' Services for the Library, began working with pre-school kids using two PET 2001's. He very rapidly found himself talking to a hun-

dred and sixty children a week. In 1983, the Department of Communications commemorated International Communications Year by funding the Oakville Computer Acquaintance Centre, *Byte Size*. This Centre is still running, now with about thirty micros.

Seeing the success of the Oakville operation, Harbourfront hired Squires as a consultant, then as full time manager when its own Centre opened in September of 1983. The Federal and Provincial governments supplied funds for a year of operation, enough to hire a full-time team of thirty-two.

One of the objectives at Harbourfront is to promote worldwide communications in its field. In fact, a three-way "tie up" was scheduled to take place in May, linking classrooms in Europe and Canada through the facilities of IBM Amsterdam.

If you're interested in what's happening at the Harbourfront Computer Centre you can contact it directly at P.O. Box 102, Queen's Quay Terminal, 207 Queen's Quay W, Toronto, Ontario, or phone 1-416-366-2054.

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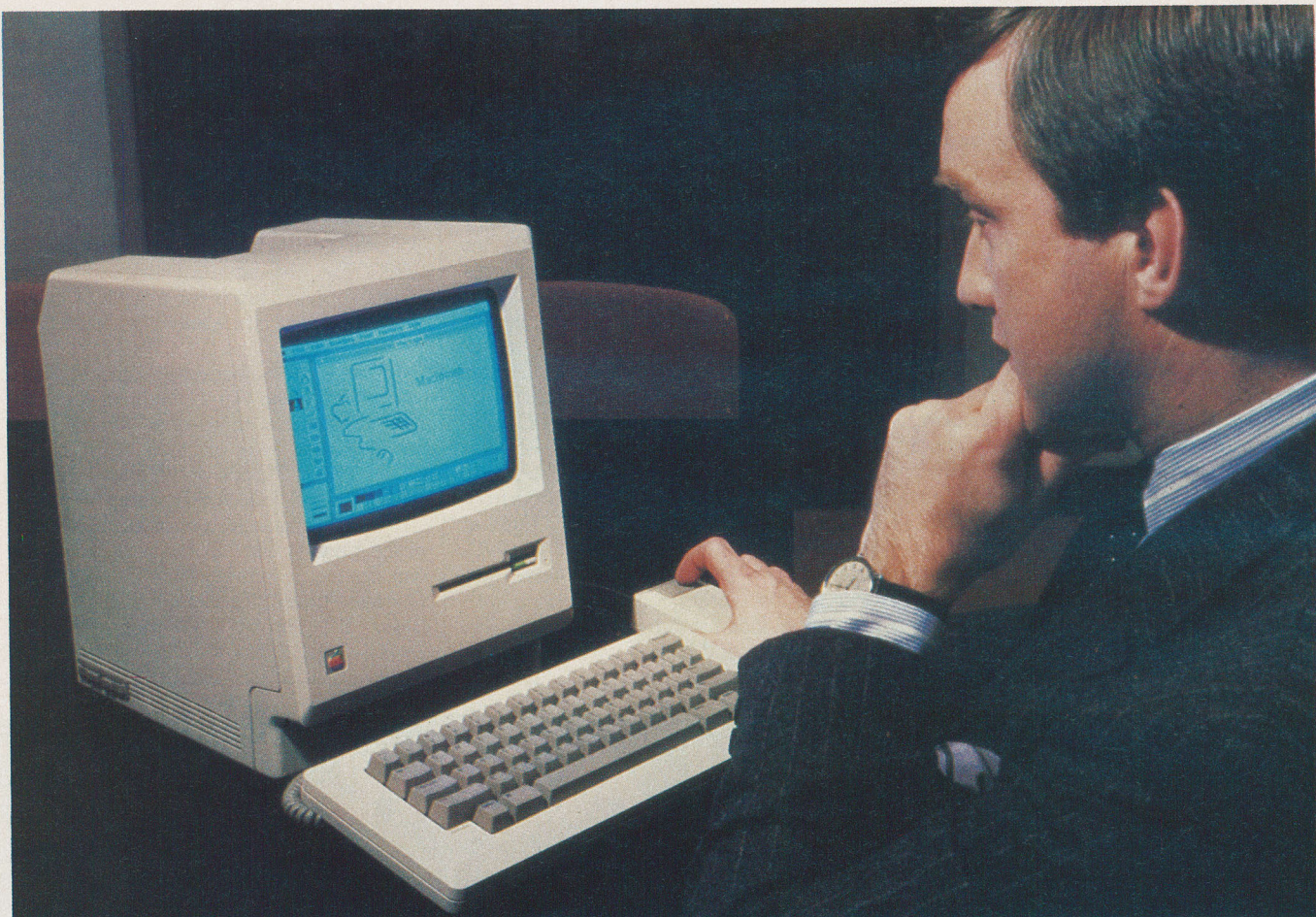
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# CN!'s Most Asked Questions



**There are some things that everyone wants to know... like, how to fill out a census form for a pregnant hamster... or whether it's really morally wrong not to pay tax on money found in phones... or which computer to buy. We've gathered some of the pertinent ones... and some appropriate answers... in this feature.**

**by Steve Rimmer**

Computers are heavily mysterious... and people who step out to buy them... dressed in jaunty spats and plastic bowlers... often come to the conclusion that this is deliberate. Not being up for mysteries that involve large portions of their personal cash, many of these souls hop into their horse drawn Honda Civics and gallop out in search of advice.

There are days when we at Computing Now! feel that absolutely every one of these

questing souls come and hang their spats on our coat trees. We get asked quite a number of questions about computers because, rightly so, we are perceived to know something about them.

After all, ours work, some of the time, at least, which is more than you can say for many of the ones that computers salesmen own. They often take their own advice, the poor devils, and wind up the proud possessors of "the latest budget system... us-

ing a new low cost two bit processor." The first answer, even prior to the actual posing of the question from which it has sprung, is that you just can't get a processor for two bits. Even dead ones cost seventy-five cents.

Thus begins a list of the questions most commonly asked by the throngs of migrating pilgrims in our parking lot. To break up the fairly dense black type that would otherwise result we've included the



answers we most commonly give to them.

### Which is the best computer available right now?

This is a good one... very much like "want to buy a pregnant hamster?" You know that if you come back with the sort of snappy answer that's welling up inside you chortling to be released the owner of the question will be offended... and you'll probably wind up with the hamster whether you wanted it or not.

We generally ask what the computer will be used for at this point, to which the questioner generally replies with "oh, everything... some word processing, some games, some business stuff, to call bulletin boards..." which is as good as saying that he or she doesn't really know. We then ask what sort of price range the human can deal with, to which said human invariably replies that money is no object and the thing can cost anything up to a thousand dollars, or more if necessary.

The formalities having been observed,

we generally fall back on the following dogma, coloured by our own prejudices though it may be.

There are two kinds of computers. In the right corner we have the low end "home" systems like the Ataris, the Color Computers and the Commodore 64. These systems are good for video games and a painless introduction to BASIC programming but they aren't particularly practical for doing serious stuff on. You can buy things like word processors and spreadsheets for them but these are severely limited for all sorts of reasons.

In the left corner there are the serious business systems... well, sort of. These fall principally into three types, to wit, the CP/M-based systems, the IBM compatible systems and the Apple clones.

We kind of like the CP/M-based systems the best, but these have some definite limitations. These things are faster than the other two types and there is more software available for them. However, many of the more powerful ones cost quite a lot. They are generally useless for games

and are limited to sixty-four kilobytes of RAM.

Apple compatibles can run CP/M as a secondary operating system, but it's very slow and such a system is limited by the Apple's diminishingly small drives. Apple clones are, at least in the cases of the very cheap ones, pretty ginchy machines and not for the faint of heart. On the other hand, you can run pretty good word processors and spreadsheets and the like under either Apple DOS or Apple CP/M and the selection of video games for the Apple is second to none.

IBM-type computers can access a half megabyte of memory, making them capable of all manner of things that just couldn't have been contemplated on an eight bit system. However, they are relatively slow computers and they're still fairly expensive.

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## MDM730

The MDM730 package is an extensive collection of utilities and patches for this unspeakably powerful code. It includes MDM730 itself, DOC files, M7LIB to change the phone numbers, M7FNK to meddle with the macro function keys and all the overlays we've been able to collect.

If you are interested in hacking yourself a version of this program... and are familiar with the nuances of 8080 code... here's a quick and easy way to get the code and the overlay source.

Just  
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Available for Apple CP/M, Access Matrix, Kaypro II, Lobo max 80, Morrow Micro Decision, Olympia single and double, Superbrain, Systel/Olympia, DEC VT-180, Nelma Persona, Xerox/Cromemco, 3R Avatar, Casio FP-1000, Epson QX-10VD, Attache, Micromate, Sanyo MBC 1000, Televideo, Zorba and on eight inch single sided single density disks.

Please note the following things

Thing 1. This code is all in the public domain. The charges for this package defer the cost of handling and postage.

Thing 2. If you are into hacking code you will freak when you see this. We are unable to answer questions about how to get this thing running... you're on your own.

Thing 3. Apple users are urged to check out the Apple MDM730 package offered elsewhere in this issue.

\*Thing 4. \$24.95 for Osborne, Olympia Single, Apple, Lobo, Xerox/Chromemco and eight inch versions.

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# CN!'s Most Asked Questions

## How can I interface a printer I bought at one place with a computer I bought at another place?

This is one of those questions that makes you really start thinking seriously about the hamsters. There is no simple answer to it.

The jacks on the backs of the two devices in question both carry much the same signals... they will both be what are called "Centronics" type interfaces if the gods be smiling on you. However, this will be of fairly little help if you have cropped up with two jacks that look physically different.

The electrical interface is cool. The physical interface is a downer.

Making interface cables is a really nasty procedure. In many cases it can be accomplished by simply pressing two appropriate connectors onto a length of ribbon cable... most manufacturers don't like a lot of hand soldering and hence arrange things so that the cables can be made this way. However, even doing this is tricky... if you get good at it you can use two bits of wood and a C clamp. Most people prefer to have the little tool that's designed to press everything reliably into place. The tool is ruinously expensive, of course.

Most computer dealers will not help you with this problem... they want to sell you the printer too. If you cannot obtain a cable from either store your only resort is to check out a components store... such as Exceltronix or Arkon... and see what they would charge to make you up a custom cable. Don't expect it to be cheap.

There is a moral in this. It's better to buy a twelve dollar cable and find that you can't get a printer to fit it than it is to buy a seven hundred dollar printer and find that you can't get a cable.

## Why do I get disk errors and what should I do about them?

Ah hah! Something easy.

A disk is a fairly poorly designed device with a slab of mylar inside a sleeve. The mylar is ferro-magnetic... it can record signals just like a piece of recording tape. Assuming that nothing causes the magnetic surface to stop working like it should, everything that goes on can be taken off.

In fact, there are a number of types and causes of common disk errors. The most obvious thing that can go wrong with a disk is for the surface of the mylar to develop a flaw or other micro-hicky that causes it to give back something other than was put on to it. As most operating systems are designed to freak out when something like this happens... throwing error messages at the

very thought of it... even the tiniest glitch can invoke some heavy wrath.

More sophisticated systems will ignore bad areas of a disk and move on to better grazing when one is encountered. However, this is not the case with most software.

In some cases you will write a file to your disk and, upon trying to read it back later on will discover that the thing has snuffed it. There are several possible causes for this.

The most obvious, and easily fixed, is that the heads of your drive are dirty and that data is not getting through the encrustations of the ages. There is a simple solution for this one.

The next is that there is a bad block of data somewhere in your file, so that you can read down to it fine but then draw an error. There are a number of ways around this. If you keep hitting return under some operating systems, like CP/M, you will be able to get past the bad bit in time. This isn't always useful, of course, if the file has to be intact to be of any help.

If you are fairly adept with a disk utility... see Almost Free Software Disk III for DU-V87, a typical specimen... you may be able to fiddle much of the file back into reality.

Finally, it is occasionally the case that the part of the operating system which is supposed to do the reading and writing will become damaged. This can be either by its having a disk error itself in the part of the disk that holds it or by simply having a few bytes of it meddled with by the whims of cosmic radiation. Either way many bad files can be recovered by booting a different disk on drive A and putting the victim on drive B.

Once data is well and truly scratched it's usually gone for good. Occasionally you'll find that the disk may be readable on another machine of the same type or after your computer has been on for several hours. However, it is reasonable to assume that a bad bad block is unrecoverable.

A disk with a bad sector is usually best binned once you've gotten what you can from it. However, if you're in a hurry or strapped for cash you might be interested in what are called bad block eliminators, little utilities which gather up all the bad blocks on a disk and make them into a single invisible file that can't be read or written to. An example of one of these things is BADLIM, on Almost Free Software Disk I.

## Is it possible to have more than one person use the computer at the same time?

This one takes a lot of paperclip breaking and pen chewing to answer properly.

The most obvious form of a computer is where one user sits down in front of it and sails. This isn't always convenient, so many users want to investigate multi-user systems, hosts and LANs. There are a number of approaches to all this.

The simplest form of multiple user computer is a regular computer with a second terminal hanging off it and a "host" running in it. We'll be presenting a simple host program next month. A terminal is simply a dedicated computer that looks at life through a serial port. Whatever is sent to it gets flung up on the tube. Whatever is typed on the keyboard is pumped out through the port.

A host is a program which sneaks into your computer's operating system and changes it so that characters sent to the screen of your computer also show up on the terminal. Characters typed at either your computer's keyboard or that of the terminal will be accepted as input by the computer. Thus, for example, a user at either your computer or the terminal could run the system.

This is a very limited multiple user system as you can still really only have one operator at a time.

The next approach is a true multi-user machine. This allows for two users... again, one having a terminal out back... to run different programs at the same time. However, while neither program necessarily knows that the other is in existence they can both access the same disks, so you could, for example, have two data base managers accessing the same database.

The final, and easily the most expensive apparition in this dungeon is the LAN, or local area network. We had a look at these things in detail in the June 1984 edition of Computing Now!. A LAN allows for any number of micro-computers to share information... data... among themselves and to use each others' resources. Thus, for example, one user could send files to another user for editing, storage or printing out.

## Should I buy a clone?

A clone will, in the long run, give you a lot less hassle than a pregnant hamster. Clones don't require much feeding and you won't wind up with a mass of little clones in a few weeks.

A better question would be "should I buy a clone rather than a genuine IBM or Apple?" Commensurate with this we usually try to provide a better answer.

If we consider an IBM as opposed to, say, a Columbia, there's a lot that can be said about both. The IBM was the first of its



kind, and, as such, it has a number of technological limitations which have been improved upon in systems whose designers have had IBM's mistakes to learn from. On the other hand, some systems have been improved upon to the point of incompatibility... something to avoid. Consider some of the freakier points.

The IBM PC is a specific arrangement of chips and stuff. It runs an operating system which is, generically, MS-DOS. MS-DOS supports a whole mass of software, some of which uses some fairly freaky characteristics of it. If you change the chips around to make the computer do something new you may still be able to run MS-DOS on it but it may not exhibit quite the same freaky characteristics that some of the software was written to expect.

This is a drag, because by the time you find out that your software is burping, the irrevocable seal has been broken and it's usually too late to get your bread back.

In addition to all this, IBM is a lot more likely to be around next year to service your system if it catches cold... something to be considered if you aren't into slinging the chips yourself.

Real IBM's, however, are expensive... the compatibles and clones do look fairly attractive for this reason alone. There are some which don't offer any enhancements, but stay faithfully close to the real thing in their architecture. They can be expected to be pretty well completely compatible with a real IBM. Furthermore they are usually fixable by just about any service place for much the same reason.

A compatible system should be viewed as a tradeoff. You get more computer for your bucks but you pay for it through more potential hassle. A real IBM is a genuine appliance. You can expect to take it home, plug it in and sail. A clone may... or may not... take some persuasion to make it be everything you want it to be.

### Should I buy a system now or should I wait for a while?

You should wait for a while. In the meantime, would you like a hamster? I got this one from the last guy who was here. It's a bit overweight but it's a good pet.

There are a number of ways of looking at this issue. Nobody wants to buy a system and see it become obsolete before their very eyes. However, on the other hand, there will always be something new ahead in the mists of California... and you can wait forever if you have a mind to.

It's not a particularly good space to go out shopping for the highest tech pinball game you can find. A computer should be evaluated on the basis of its ability to do the

tasks you have in mind for it. If a currently available system can cut it... and you can manage the financing... go for it.

Waiting for a while will do two things... the prices of current hardware will drop and better stuff will emerge to replace it. You can take your pick as to which you're waiting for. However, if you are looking for lower prices there are a few trip wires and snake holes about.

To begin with, much of what makes the popular systems so popular is the infrastructure of support which has grown up around them. To be sure, this won't vanish immediately when the systems get a bit long in tooth but, by the time their prices really start getting down to poverty levels most of it will have mutated into support for newer, more popular equipment.

Secondly, a lot of the currently high prices are caused by chip shortages. While this could improve with time, it's very likely that it won't. It is in the interest of the semiconductor manufacturers to keep the supply a bit strangled, and, as such, the screaming price reductions which came down on VIC 20's and Apple clones may be a bygone phenomenon.

### Can I get a good system by buying a small, inexpensive machine and expanding it as I go?

This works well with hamsters... but not quite so well with computers. Hamsters are self-integrating, you see... micros are anything but.

Quite a number of people have been turned onto small plastic computers by ads for the Commodore 64 and the like. The idea is that you get this little three hundred dollar wonder now and then plug stuff into it... forever... until it will do everything a business computer will do.

If this were true it would be a bad idea, as all the plug packs would wind up costing more than a proper system would by factor of four. However, it's not only an expensive approach... it's impractical too. There are hidden gotchas in all of this which they very definitely *don't* mention on the ads.

Any computer is an optimized association of the various things that make it up. In order to make systems cost effective and all the other things that the boys in marketing insist on they are done up with no slack included... in other words, everything runs as fast as it can and as efficiently as it can for the price.

Now, consider, for example, a co-processor. The Commodore 64's long awaited CP/M option involved the use of a Z-80 processor which was plugged in to

assist the 6510 already in the machine. Now, the 64 is a fairly fast machine with its 6510 because everything has been designed for it. The Z-80, however, is the wrong processor for its hardware architecture and, as such, the CP/M operating system that was designed for this accessory had to do a lot of fudging to keep both processors smiling.

The result of this kind of swamp party is that a lot of the system's resources are used up in internal housekeeping. The effect of all this is that the machine doesn't run very quickly and lacks other things that make it acceptable as a small computer.

A small home system with plug packs stretching out into the fourth dimension will... at least in theory... run business software and do some meaningful stuff. However, in the cosmic sphere of reality all that expansion will have so degraded its performance that the result will be a computer that's very nearly useless... at least in terms of the power available under a proper system running this type of software. **CN!**

## Stockboy Inventory Control Package

Inventory control programs are generally pretty expensive... and most are extremely inflexible, even after you negotiate the financing. Commercial software often suffers from poor human engineering, and you may find that even small inventories generate gargantuan disk files.

Stockboy is a good, powerful, flexible, cheap package which will handle the inventory for most small businesses. It costs less than a box of disks.

### Stockboy can:

- Maintain an inventory database with current, maximum and minimum stock, reporting when an item needs re-ordering.
- Be a point of sale terminal, adjusting the stock data base on line.
- Produce individual packing lists.
- Generate a customer list to be used in mass mailings.
- Run on any CP/M or MS-DOS based computer, even an Apple II running with a soft card.

Stockboy is written in Microsoft BASIC, and is designed to be easily altered to suit your needs. It can be compiled using BASCOM if you desire. It is designed for use by non-technical operators.

The complete source of Stockboy will be appearing in Computing Now! over the next few months. However, if you'd rather have it all in one shot, it's available for \$29.95 on a five-inch disk and for \$34.95 on an eight-inch single-sided single-density disk. We are currently able to provide the package in formats for the Apple II, the Osborne, the Nelma Persona and the IBM PC. Ontario residents please add 7% provincial pinch.

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# dBase II Report Generator

One of the nicest things about dBase II is its sophisticated capacity for presenting information. This information, called a *report* no matter what data it is, can be presented in as complex or as simple a format as you require it. The more involved aspects of reporting on dBase generally require additional dBase command files... in essence, additional code to run under dBase. However, many users vastly underestimate the power of dBase's built in reporting functions.

The various manuals and books available to deal with dBase generally launch themselves immediately at its most powerful... and involved... capabilities. Getting some understanding of exactly what you can do with the report generator, and how to go about doing it, may be a bit of an exercise in collecting scraps of information.

In this feature we're going to check out some of the techniques for reporting with dBase. Most applications lend themselves to this level of presentation and, unless you are into something fairly esoteric, you'll probably find that this approach to reports will handle most of what you need to spew out onto paper.

## Mysterious Hieroglyphics

The command structure of the dBase report generator is, like dBase in general, decently far removed from the hieroglyphic style of most computer commands. In basic English, the report function of dBase II has the syntax

**REPORT (FORM file) scope (FOR expression) (TO PRINT) (PLAIN)**

Don't worry if you're like me and occasionally have to look up your own phone number. You don't have to memorize all of that. You only have to use most of it once for a given report. The report function gives you a quick and consistent way of extracting information from a set of dBase II records that you've already created.

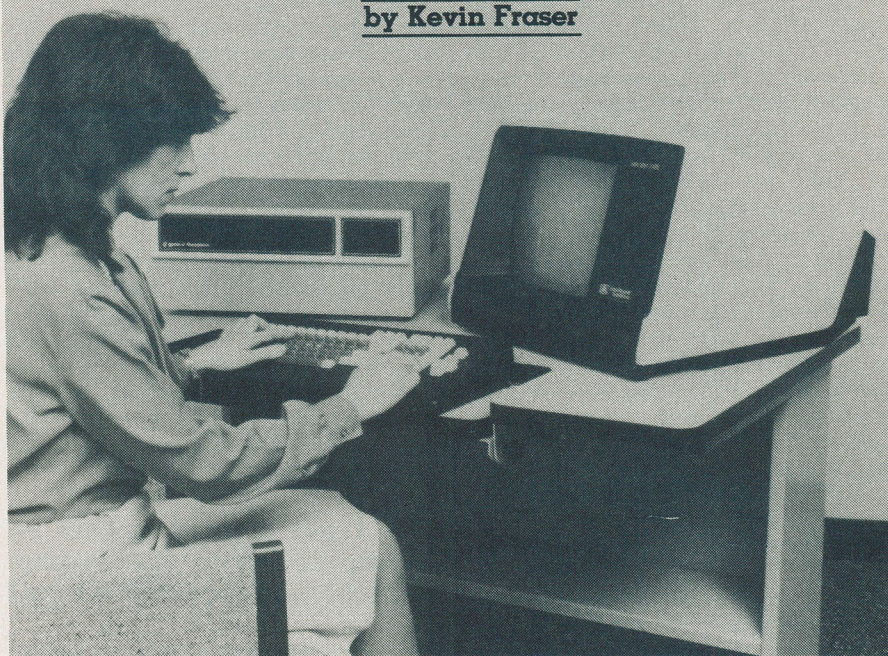
Here's what that syntax means in humanspeak.

The **REPORT** command means that you want dBase II to do a report of some information that you've previously stored in a dBase II file. You'd have probably guessed this without too much cranial scratching. **FORM** is the file that contains the instructions that you have given telling dBase II exactly what records you want the report to put on the paper, and how. This sounds a bit ambiguous, to be sure... the mist will clear as we go along.

**SCOPE** and **FOR** are rather powerful... but would take some explanation. Once again, we'll defer these, as they aren't that

**The problem with using the most powerful database manager in creation is largely in keeping all that power under wraps so that it doesn't leap out of the keyboard and gnaw your fingers. In this feature we'll have a look at taming one of the more fiercesome aspects of dBase II, the report generator.**

**by Kevin Fraser**



important for basic reporting. The **TO PRINT** part makes dBase II squirt the report out through the printer and **PLAIN** keeps the date, page numbers, and record numbers out of the picture. No use cluttering up the page first time out.

To eliminate the possibility of wiping out any valuable data you may actually have plans for, let's create a guinea pig dBase II file with names, addresses, phone numbers and comments about these entries... and then make up a phone list report.

## Journey of a Thousand Miles

The obvious beginning to any exercise like this is to boot dBase and get your computer used to it. It will come up and ask you what day of the year it is. Don't tell it. Just press enter instead.

You should get dBase's sign on message and the **''** prompt. Type

### SET DEFAULT TO B:

This makes dBase II put all your files on the disk in drive B.

Assuming that no pyramids have fallen on your computer yet, type

## CREATE FONELIST

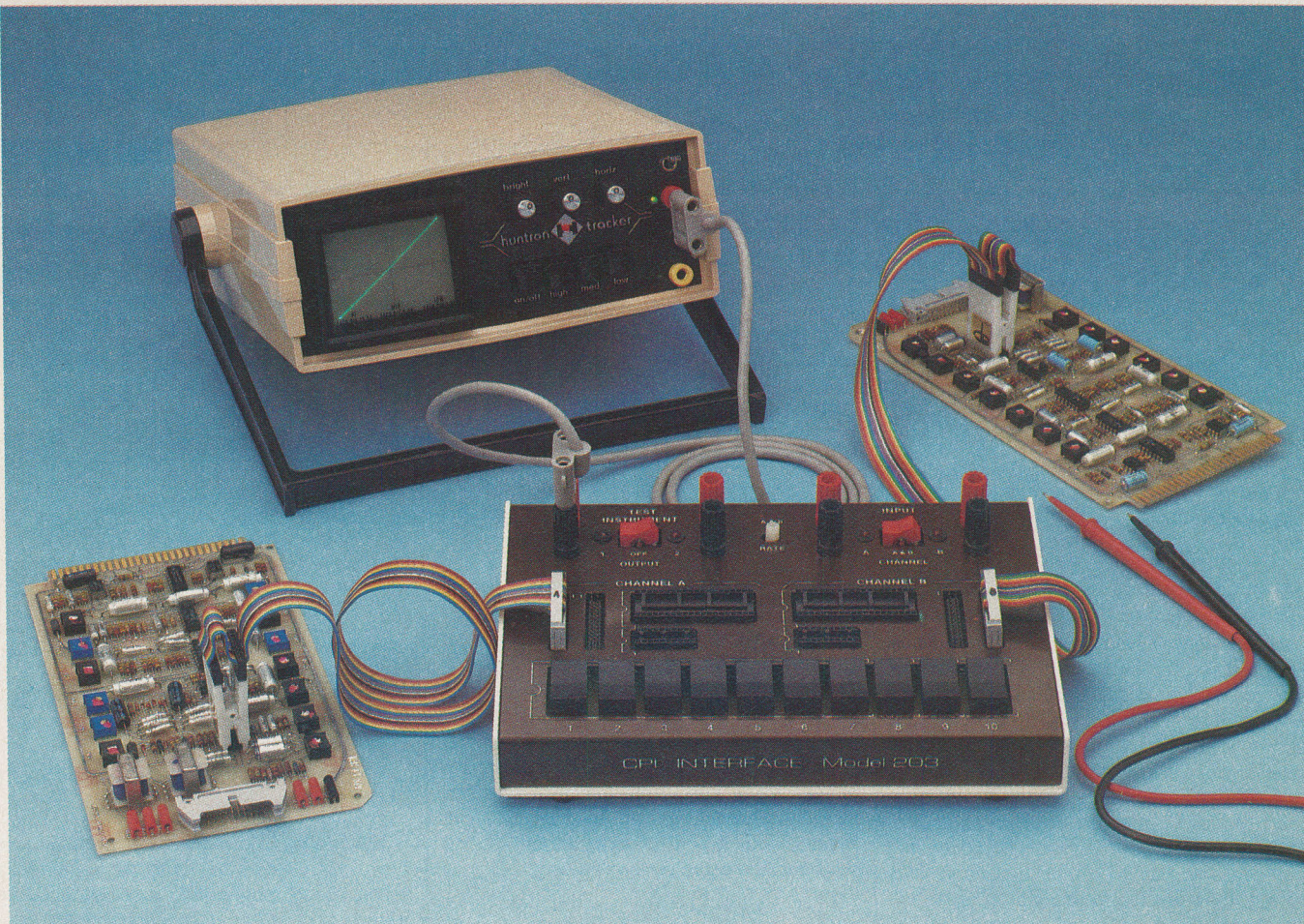
The disks will buzz away for a while then ask you to tell it what you want the records to be like. You can tell it anything you like, here, but knowing the local dialect is important.

Make sure your printer is on-line and press control P once. You will not see or hear anything happen when you do this, but from now on everything that happens on the screen will happen on the printer as well. Press **RETURN** once. The printer should jump and print a period, just as if it were the screen.

If you don't understand what you're doing at this point, just type in exactly what you see in lowercase in figure one. The uppercase parts are what dBase II has to say about all this. The parts next to 001, 002 and so on are what you type. The screen and the paper on your printer should look like figure one when you're finished.

When dBase presents you with field number 010 just press enter and it will ask you if you want to enter any data now. First, type control P to shut off the printer. What happens next is full screen editing which your printer will be hopelessly confused by.





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In-circuit ICs may be tested using ribbon cables and IC clips to connect directly to the ICs on circuit boards. Out-of-circuit ICs may be tested using sockets mounted on the Interface. In either case, test signals from the device under test and a known good device are routed through the Interface to the desired test instrument.

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The Interface can also be used with general purpose test equipment such as multimeters or logic probes. This feature is useful when the user wishes to take measurements or make comparisons of voltages, signal levels or logic states in powered circuits.

## Additional Features

The Interface also incorporates jacks for connecting Microprobes so that point to point testing may be done at any time without disconnecting the Interface from either test instrument. This permits the user to leave the Interface connected to test instruments on the service bench at all times and go from "power down" Tracker, or ohmmeter testing to "power up" measurements at the flick of a switch.



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# dBase II Report Generator

```
. create fonelist
ENTER RECORD STRUCTURE AS FOLLOWS:
FIELD      NAME,TYPE,WIDTH,
          DECIMAL PLACES
001        fname,c,10
002        lname,c,15
003        addr,c,20
004        city,c,15
005        prov,c,4
006        pcode,c,10
007        phone,n,8,4
008        area,n,3
009        remark,c,79
010
```

Figure 1.

Next, say *Y* and the screen will clear, showing you the structure of the file with the cursor next to the *fname* field ready for inputting data. The colon at the end of the line shows you how much room you have to type in that field's data.

Now you can start typing in the contents of that dog-eared address book you keep promising yourself you'll computerize. For each person, type their first name into *fname*, their last name into *lname*, their address where it says *addr*, and the appropriate stuff for *city*, *prov*, *pcode*... that's their post code... phone number and any comments you wish to have associated with that person such as "never picks up tab" if it's the boss.

To get some practice, and so that we can generate a respectable looking report, put in fifteen records or so. Purposely put them into the database in non-alphabetical order. If you make any mistakes, the dBase manual will explain full screen editing, so I won't bother re-explaining it, except to say that most of it is quite similar to WordStar's editing functions.

Now we've got some data to play with. Although it is possible and reasonable with only fifteen records to just page through the database using the edit command until you find the record you want, it's not very high tech. More to the point, it's seriously impractical when you actually start dealing with real world sized chunks of information.

```
. use fonelist
. report form phone
ENTER OPTIONS, M=LEFT MARGIN,
L=LINES/PAGE, W=PAGE WIDTH
PAGE HEADING? (Y/N) y
ENTER PAGE HEADING: Phone Directory
DOUBLE SPACE REPORT? (Y/N) n
ARE TOTALS REQUIRED? (Y/N) n
SUBTOTALS IN REPORT? (Y/N) n
```

Figure 2.

Naturally there's a way to put records into the system in any order we please, as you've done, and always be sure they will come out in perfect, infallible alphabetical order every time. From the '.' prompt, type in these ancient incantations

## INDEX ON LNAME TO LAST

The disks will whirr for a while... don't worry, it's not about to reformat the disk for you. When the red lights flicker out for the last time type

## INDEX ON FNAME TO FIRST

This probably seems a bit like additional cave writings. However, in English it means that you've just told dBase II to make sure that any report you generate from this database from now on will present the records in perfect alphabetical order, by name, every time. Note that this does not mean the actual records themselves have been sorted. If you try to edit them, they'll still be in the same order you originally put them in.

## Unleashing the Power

Now let's put dBase II to work. The screen of your computer should look like figure two. You should now dig through the coffee cups and cough up that piece of paper with the field definitions listed on it. All you're doing here is telling dBase II how wide each column of the report is going to be, and what fields you want to have stacked in each one. Having done this, proceed to figure three.

For this report we only want four columns, specifically, the last names, first names, area codes and phone numbers. As most users are faced with printers that normally fall into the void after the eightieth column we'll make the total of all the columns add up to eighty.

If you've actually been typing this stuff in as we're going along, you're probably starting to develop a feel for what's going on here. So much the better. Figure three is what the screen should look like when you're done.

When you get to column five just press enter and your report will come spewing out of your screen far too fast for it to be of any use to anyone with the exception of first officer Spock. Not to worry, we'll put it on paper in a second.

dBase II is rather considerate of this drudgery you just went through for its' sake, and it won't make you repeat yourself. All the column specifications you have just entered have been saved, and henceforth,

```
COL      WIDTH,CONTENTS
001      20,lname
ENTER HEADING: Name
COL      WIDTH,CONTENTS
002      40,fname
ENTER HEADING:
COL      WIDTH,CONTENTS
003      10,area
ENTER HEADING: Area
COL      WIDTH,CONTENTS
004      10,phone
ENTER HEADING: Phone
COL      WIDTH,CONTENTS
005      -
```

Figure 3.

whenever you want the latest updated phone list from your database, you can simply make sure your printer is on-line and type

## REPORT FORM PHONE TO PRINT PLAIN

If you've followed my instructions up to now, you will note there is a perfectly alphabetized phone list of your favourite friends and enemies spewing out of your printer. When you've finished wiping the tears of joy from your eyes, you might want

```
. use fonelist
. report form address
ENTER OPTIONS, M=LEFT MARGIN,
L=LINES/PAGE, W=PAGE WIDTH
PAGE HEADING? (Y/N) y
ENTER PAGE HEADING: Address List
DOUBLE SPACE REPORT? (Y/N) n
ARE TOTALS REQUIRED? (Y/N) n
SUBTOTALS IN REPORT? (Y/N) n
COL      WIDTH,CONTENTS
001      16,lname
ENTER HEADING: Name
COL      WIDTH,CONTENTS
002      11,fname
ENTER HEADING:
COL      WIDTH,CONTENTS
003      21,addr
ENTER HEADING: Address
COL      WIDTH,CONTENTS
004      16,city
ENTER HEADING:
COL      WIDTH,CONTENTS
005      5,prov
ENTER HEADING:
COL      WIDTH,CONTENTS
006      11,pcode
ENTER HEADING:
COL      WIDTH,CONTENTS
007      80,remark
ENTER HEADING:
COL      WIDTH,CONTENTS
009      -
```

Figure 4.



to proceed even further into the steaming jungles of figure four.

Try this command

# REPORT FORM ADDRESS TO PRINT PLAIN

That ought to keep the boss in awe for a while. Do some experimenting, but keep the filenames for the report forms simple and mnemonic. Who wants to try to figure out what "defmlzbg" means when you're facing a deadline?

There is, as there always is at the ends of articles like this one, a lot more to this powerful feature of dBase. However, having gotten over the initial syntax of the thing you will probably find that the rest of it isn't nearly so difficult to get your head around.

One of the very encouraging things about the way that dBase deals with its data is that it doesn't change your database... it just looks at it in different ways, depending on how you prod it. Thus, for example, you can feel perfectly safe in experimenting with



the commands we've looked at here. They can give you error messages until the cows come home but, unless the wrath of God has nothing to do today and decides to come and live in your computer there is

nothing you can do to permanently change it.

Now, quick, how would you report the data in order of ascending post codes? Ah hah!

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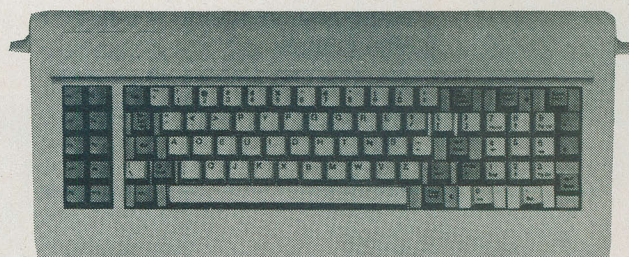
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# Dimension Review



If you aren't quite sure what software you'll be running, perhaps you should be looking for a machine which runs absolutely everything. The Dimension 68000 does that... and just a bit more.

by Steve Rimmer

**T**he word "clone" is a very nasty thing to the wee folk that build computers... deep in the bowels of the earth where the humans can't see. Even the people who build clones don't think much of this term, preferring things such as "workalikes" and "emulators".

The thing about all this compatibility stuff, however, is that all the computers which are compatible with the software for one brand of system are, by definition, incompatible with that for everything else.

This sort of stands to reason. Granted, one can play around with co-processor cards and such to make, say, an IBM run Apple software, but this is so very low tech. More to the point, these cards come with page long lists of limitations and gotchas... which, in many cases really should have been expanded into thick hardbound books and labelled "volume one".

There is one system which ignores the limitations of compatibility. It takes the approach that by simply emulating every

known micro-computer it is capable of running whatever software the trembling fingers of the outside world should feel like stuffing into it. The Dimension 68000 from the Micro Craft Corporation is a very slick thirty-two bit system with some pretty amazing features. While its primary operating system, CP/M 68, is almost devoid of applications software, it does come with a single disk that makes it easily the most powerful computer available.

Pat it gently on the head and it will



become a perfect replica of an Apple ][+, an IBM PC, an Osborne, a Kaypro II or, with some work, virtually any other computer you have need of.

Yes, this does sound very much like something they advertise on late night television for twenty-nine ninety-five plus three dollars for postage and handling. However, the Dimension is real... and it costs considerably more than twenty-nine ninety-five.

## Higher Order Universe

The Dimension 68000 looks a little bit like an IBM PC. In fact, this impression is heightened somewhat by its affinity for PC style keyboards... it accepts all the standard ones from Keytronic, Maxiswitch or even IBM itself if you're up for it. The box has two very flexible half height disk drives with room for a hard drive.

Based on the Motorola 68000 microprocessor, the Dimension is a true thirty-two bit machine. However, its hardware supports a very flexible physical bus, which has been designed to allow the addition of other microprocessors to the computer. Presently there are three processor cards available for the system, to wit, the 6512, an enhanced 6502, the 8086, a superset chip of the 8088 that powers the IBM PC and, of course, the faithful Z-80.

The software which comes with the system includes complete emulations for several popular machines and if you run one of them the appropriate processor will wake up and take control of the foreground activities of the system. The 68000 still handles the housekeeping. As such, things like disk I/O and the screen functions are extremely slick.

The surprising thing about the Dimension's emulations is how incredibly good they really are. If you run APPLE the thing thinks for a while, asks for an Apple disk and flips its tube to a forty column screen with Apple style characters. The APPLE ][ boot message turns up at the top and the drives will read Apple format disks. All the Applesoft BASIC syntax is supported... as are all the PEEKs and POKEs of a real Apple. As with all the simulations the system will block off a chunk of RAM for the synthetic computer to use equivalent to what one would really have in a genuine version of that system.

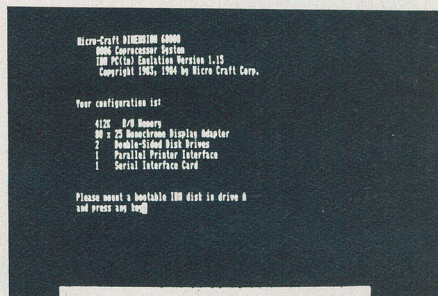
The system also emulates the popular Apple peripheral cards. Typing PR#3, for example, activates an eighty column screen display.

The really slick aspect of the simulations is how well they deal with unusual situations. Video games are actually among the most

unkind things to try on a clone because the nuances of copy protection that slither about these disks are often hung upon obscure characteristics of the systems they are designed for. The Dimension was quite happy with many games that blasted the silicon craniums from lesser compatibles. Our two favourite pit vipers, the Microsoft Flight Simulator for the IBM and Zaxxon for the Apple, both ran flawlessly.

It's worth noting that while the Dimension we got to play with only supported software for the three processors commonly in use at the moment but, because of the structure of the hardware there is no restriction as to what could be plugged into the system. Micro Craft maintains that new co-processors will be available for the machine as the chips are released.

Little fuss is actually made over the 68000, easily the most sophisticated chip in the machine. In fact, except when the system first boots, the main processor is only used to handle mundane stuff. At the moment there is little else to do with it. However, this is the same chip as is found in the Apple Macintosh and Lisa systems and it has been suggested that there may eventually be emulators available for these machines as well. The boys at Micro Craft are said to be giving it some thought.



## Saying hellow to the IBMulation Beyond The Fiberglass

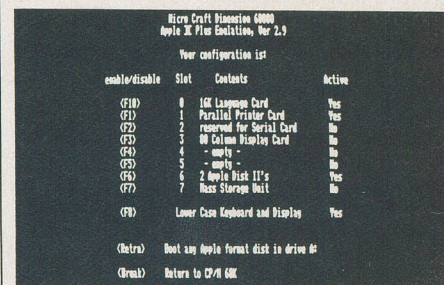
The most common configuration of the Dimension is as a machine with a half a megabyte of RAM. Unlike as in the case of 8088 based systems this does not even begin to approach the addressing capacity of the 68000 processor, and up to sixteen megabytes can be included in the machine by plugging memory cards into the system's expansion slots. To look at this another way, a fully loaded Dimension can store more information than three hundred Apple clones... assuming that you could actually find three hundred Apple clones that worked.

Memory is added to the system in chunks of a hundred and twenty-eight kilobytes.

There are six expansion slots on the

system. These can hold the aforementioned memory expansion if you are able to find a use for all that storage, the co-processor cards or custom I/O and interface hardware.

The system supports a hard disk controller as an option. It handles two Winchester drives which can hold three hundred megabytes of data or garbage or a mixture of both. The Dimension allows you to take your choice of four operating systems with which to generate garbage... an unparalleled opportunity, this.



## The artificial Apple's artificial hardware.

For the more plebian user the system also has two five and a quarter inch floppy disks; you don't have to choose them as options... they come with the beast. The drives hold over eight hundred kilobytes each unformatted. The system can also support eight inch drives and both three and a quarter and three and a half inch pico drives.

There is also the usual assortment of ports, functions and three eyed sloths bristling from the gun turrets. Included in this is an RS 232C interface, a printer port, a game paddle interface, a squeaker speaker and a real time clock.

The video interface of the system is a trip in its own right... it can synthesize all of the screen displays of the hardware the Dimension likes to pretend to be and a few that haven't been thought up yet. In its tightest interlaced mode this allows for fifty lines of one hundred characters per line and comparable high resolution graphics. The system can handle sixteen colours.

Wait, wait, the circus isn't over yet.

The CP/M 68 package that comes with the Dimension is a genuine Digital Research deal, complete with one of their hardcover binders full of documentation. Unlike the poorly written, cryptic and often times useless documentation for CP/M 80 we're all used to, this is poorly written, cryptic and often times useless documentation for a brand new package of software. No, actually, in fairness, it's worlds better than the original CP/M manuals.

The system disk we got came with all of the usual CP/M utilities... written for the



# Dimension Review

68000, of course. Just like yesterday there were PIP, ASM, STAT and all the other unholy denizens of the plastic world smiling out of the tube with evil leers. CP/M 68 object files have the extension .68K.

This, in itself, is a good start, as users who are familiar with CP/M on a lesser system will have little hassle picking up the local dialect. On the other hand, CP/M is not a user friendly environment under any processor, and if you're new to all this CP/M 68 will be as much of a psychic head bender to learn as would be any other versions of it.

The thirty-two bit environment of the 68000, by the way, has introduced some new terms into the documentation's vocabulary. We're all familiar, for example, with nybbles, bytes and words... now we have *longwords*. This is the babble for a thirty-two bit number.

The CP/M utilities are a bit dull and we would probably have cheerfully ignored this disk altogether except for something perporting to be BASIC. What ho! We blasted BASIC onto the screen and discovered this really bizarre little language. It tasted like fruit.

[illegible]

## The CP/M 68 mode

The BASIC package for the CP/M 68 disk should not be confused with the Apple II+ simulation, which it isn't... they actually have nothing to do with each other. However, the BASIC does support all of the good bits of Apple BASIC... with virtually all of the glitches removed. It's enhanced out to the limit of the hardware, with much higher resolution graphics and sixteen colours. Naturally, you have your choice of screen sizes and other quintessential features.

This is actually about the only practical way to write code for the 68000 with the system as it stands. There is, of course, the CP/M ASM program, and the operating system kindly includes a first rate C compiler as well. However, ED, the editor, isn't all that easy to use for large files... you've really got to *want* to do it. I suppose you could write a small editor in BASIC and use it to write a better editor in C, and so on.

The other mildly fascinating aspect of

the system disk is a collection of screen format programs. You can use them to select any size screen you want, ranging from a grotesque twenty by twenty characters to ultra high resolution type with fifty lines of text... not recommended for economical monitors... or hundred character lines. These are pretty slick. Presumably combinations of line lengths and screen depths not presently supported by the system could be implemented... a quick blast with DDT indicated that the code for them is fairly trivial.

#F30FL			
F30F-	20	B7	00
F312-	20	3E	D9
F315-	4C	D2	D7
F318-	A5	DA	
F31A-	85	75	
F31C-	A5	DB	
F31E-	85	76	
F320-	A5	DC	
F322-	85	B8	
F324-	A5	DD	
F326-	85	B9	
F328-	A6	DF	
F32A-	9A		
F32B-	4C	D2	D2
F32E-	4C	C9	DE
F331-	B0	F8	
F333-	A6	AF	
F335-	86	69	
F337-	A6	B0	
F339-	86	6A	
JSR			#00B7
JSR			#093E
JMP			#0702
LDA			#0A
STA			#75
LDA			#DB
STA			#76
LDX			#DC
STA			#B8
LDA			#DD
LDX			#B9
STX			#DF
JMP			#07D2
JMP			#DEC9
BCS			#F32E
LDX			#AF
STX			#69
LDX			#B0
STX			#6A

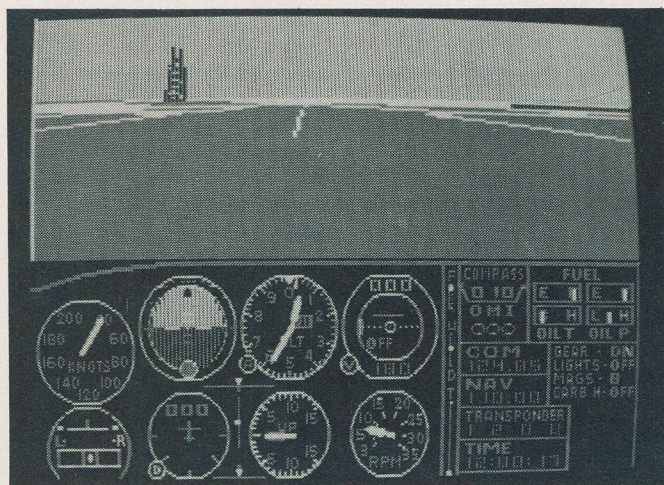
**If you try to CALL-151 on the fake Apple... it works!**



## Specs...

<b>Operating system</b>	CP/M 68
<b>Main processor</b>	68000
<b>RAM</b>	512K
<b>Ports</b>	<i>Serial and parallel</i>
<b>Graphics</b>	<i>16 colours, to 640 x 500 pixels</i>
<b>Software Included</b>	<i>CP/M 68, C, custom BASIC, utilities</i>
<b>Disk drives</b>	<i>2 5 1/4 inch DSDD</i>
<b>Screen display</b>	<i>any size to 100 x 50 characters</i>
<b>Price</b>	<i>\$5995.00</i>





The Microsoft flight simulator flew perfectly.

### Change Dimensions?

So, here you are, sitting at the crossroads of the cosmos playing mumbly peg with the three headed mastiff of creation pondering on the meaning of all these eternal toys. The heavens are replete with vast and swollen stars that bleat helplessly before the awesome trembling of the eons, the Almighty grasps reality in his fingers, presses it into the galactic jack and in trillion mile high letters the thought glows across the skies.

RUN... a comet streaks towards the RETURN key.

The Dimension is unquestionably one of the most well thought out, profound applications of available technology I've seen in recent history. While things like the Macintosh and the Lisa are nice, they were obviously designed the way they were with commercial ambition and good honest corporate greed in mind. The Dimension would seem to be entirely devoted to being a faithful, multi-talented servant of humankind.

Now, the Dimension is not cheap. In fact, unless you have something of great worth to mortgage it's probably of questionable affordability. It isn't the machine for everybody.

It's probably unrealistic to buy a Dimension just because it is a neat clone replacer. You can buy a lot of really authentic compatible systems for the price of one real Dimension. On the other hand, if you want to be able to run all sorts of software and be absolutely sure of having a grip on the art for the foreseeable future you can't ask for a better computer.

Overall, the Dimension 68000 which we played with was a ruggedly built, brilliantly thought out machine. There is little one could point to in it and call a fault if you ignore the price for a moment. Its emulation modes suffered from none of the usual restrictions of emulations, to wit, they were every bit as fast, flexible and useful as the real systems. The documentation which came with it wasn't too exciting but it was clearly written and easily understood.

Now, for the punch line. The Dimension system starts at around six thousand dollars. It's available from Popular Electronic Products, 164 Kenneth Street, Suite 102, Duncan, British Columbia, V9L 1N4 1-604-748-3222.

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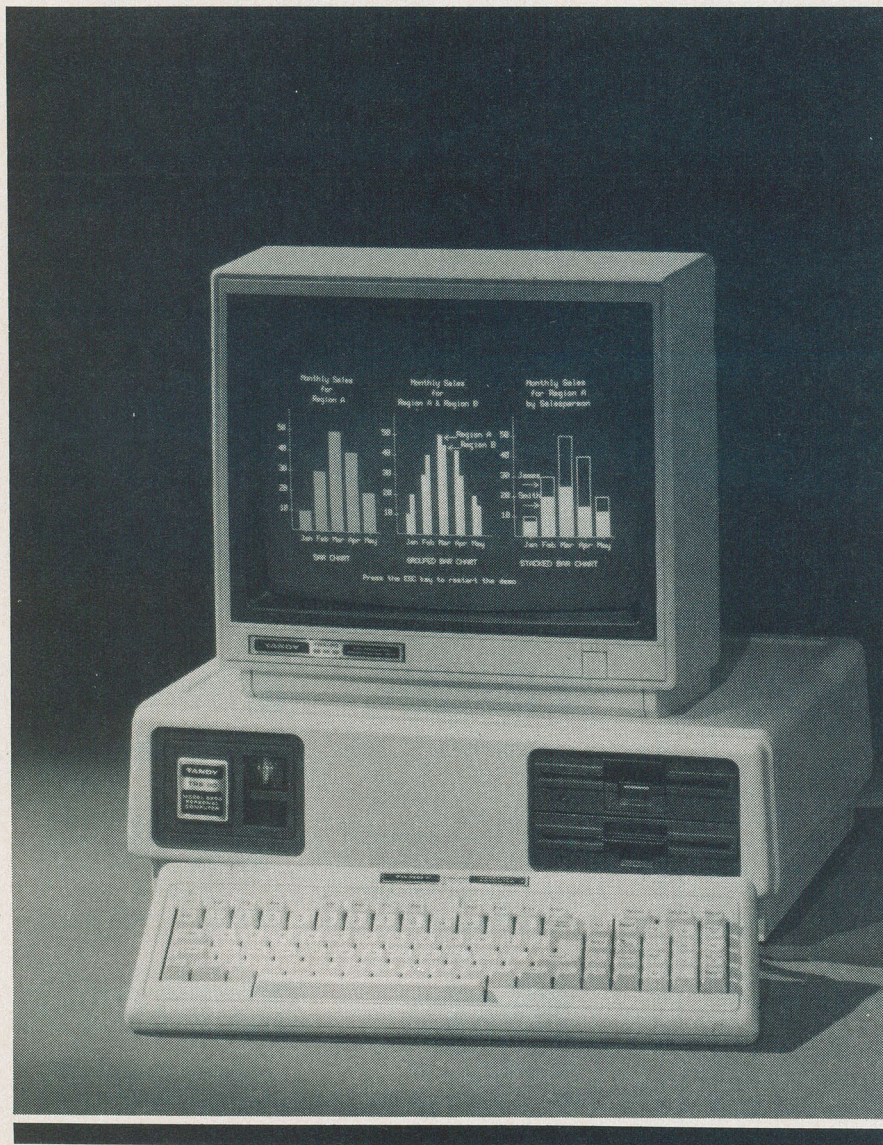
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# TRS 2000



**Looking not at all like a stereo, the TRS 2000 is a superb bit of technology from the company that brought us bookshelf speakers, radios in pink stuffed cocker spaniels and the endless part number.**

**by Steve Rimmer**

**T**he serious Radio Shack computers that have emerged to date have all had one thing in common... their TRSDOS operating system was a unique little beast that could be found only within their grey injection moulded hides. Now, TRSDOS isn't necessarily bad... it's just unusual, and the software available for it is limited when compared with the libraries available for CP/M and MS-DOS based systems.

Third party suppliers have created CP/M packages for all the Z80 based Radio Shack systems, and some of them, like the Model II, have proven much more popular as CP/M based computers than they could ever have hoped to have been using TRSDOS.

The TRS-80 model four was, in fact, designed to run CP/M. The boys in Fort Worth obviously realized that they were going to have to get into the mainstream software market to keep their computers afloat.

Recently, there emerged a TRS-80 which doesn't even pretend to run TRSDOS. The TRS-80 Model 2000 is an IBM compatible computer running Microsoft MS-DOS, a grab for the expanding business market. A powerful and cost effective system, the new Model 2000 looks to be a fairly decent computer for anyone needing a lot of technology in a box.

In some ways it even out IBMs IBM.

## **Grey and Blue**

The Model 2000 is not, to begin with, an IBM clone in the sense of many systems which are simply re-laid out PC's. It has a number of technological advantages over the straight up IBM... which, in turn, also means it has a few potential incompatibilities with it. The folks at Tandy maintain that the system will run at least fifty percent of the existing MS-DOS based software without any patching.


The new toy is based on the 80186, a sixteen bit microprocessor with the same instruction set as the 8088 which drives the IBM but uses a sixteen bit data bus. The chip runs at eight megahertz, as opposed to slightly under five for the standard 8088 based machines.

The graphics of the Model 2000 are also a notch better than those of the PC, having the capacity of displaying up to eight colours in the highest resolution... six hundred and forty by four hundred pixels... screen mode. The IBM can only do black and white in its highest resolution mode.

Like the disembodied souls of comatose wombats, the specifications of the Model 2000 stand upon those of the PC and dance a bit. The disks can hold seven hundred and



# Software Now!

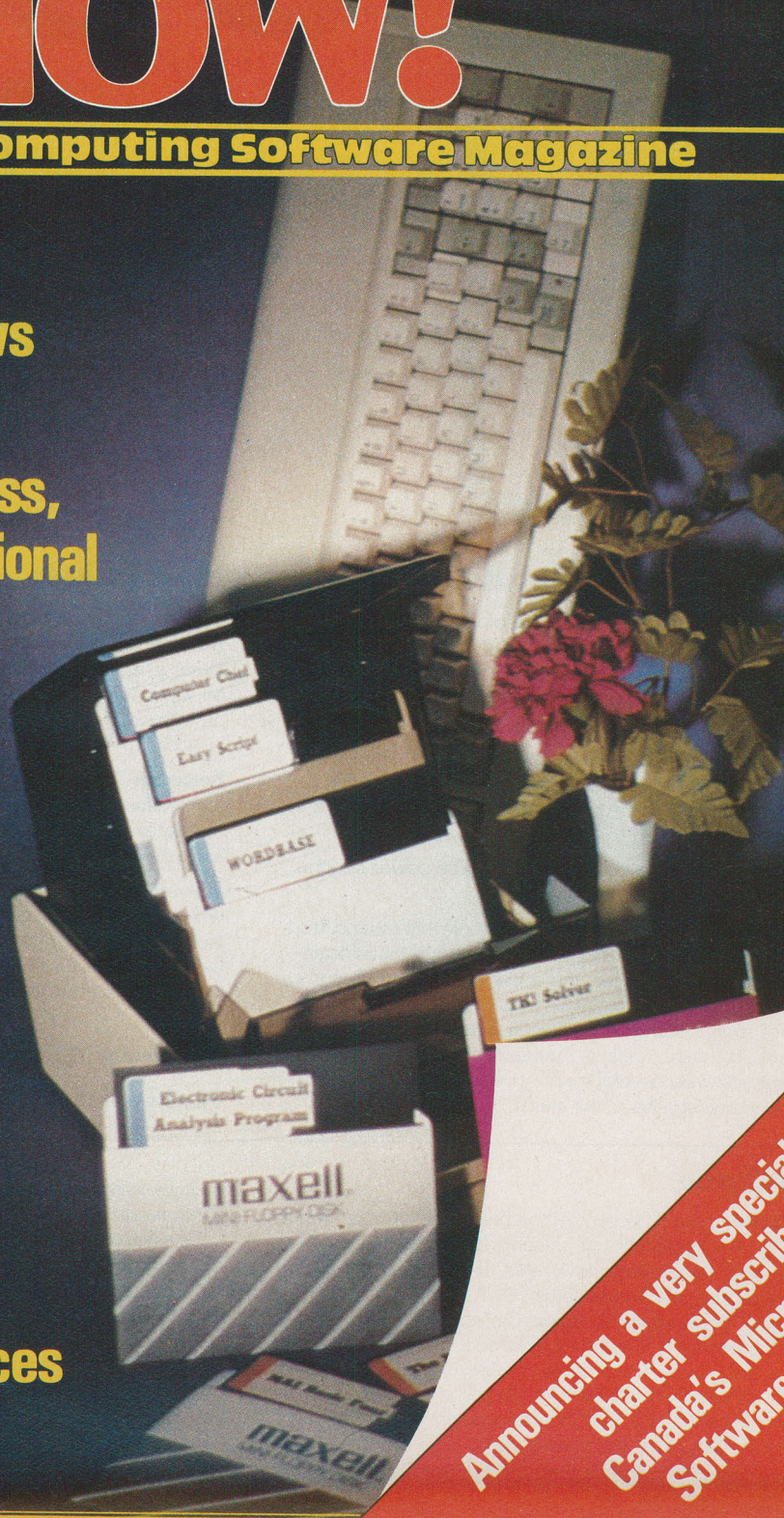


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ISSUE  
OCTOBER 1984**

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### From The Editor.

Not knowing about software is a multiple edged sword. Not only don't you know what you need; you don't even know what you're missing. It's terribly easy to leap upon the first package that comes within waving distance of your application and then bend your application to suit it.

This is not the way it should be.

There is software for every use, perfect software for any conceivable purpose . . . but finding what you want can be a drag, if for no other reason than the constant repetition of the tune from Mission: Impossible playing inside your head.

The fabulous thing about editing a magazine like this is that you get to play with every package in the cosmos. However, this is extremely tiring . . . the fabulous thing about reading a magazine like this is that you get the benefit of being able to play with every package in the cosmos without actually having to do all that typing.

**Software Now!** will keep you abreast of what exists, tell you what probably shouldn't exist and inform you about where to get it so you can make it all exist for your needs.

We know that **Software Now!** is going to become one of the most essential accessories any computer user can own. Subscribe . . . Now! . . . and let us prove it to you.

*Steve Rimmer*

**Steve Rimmer**  
Editor,  
**Software Now!**

# Softw Now!

## First Issue Octo

### A New Canadian Publication for the Ultimate Medium

The difference between we humans and the other inhabitants of the planet is our capacity for making tools. Civilization is often measured by its grasp of technology . . . it's through his use of tools that man has come to be able to manipulate his environment.

The computer is the ultimate tool . . . it is, like man himself, unspecific, and thus adaptable to virtually any task. The same computer can be a bookkeeper, a game, an artist's palette, a composer's amanuensis, a word processor or a programmer's development station.

The computer itself is simply a box full of chips. The power of computers lies in the software that runs on them.

**Software Now!** is the new magazine for people harnessing the power of the microcomputer. In its pages you will find the information which you will need to choose and apply the software that will dedicate your computer to your tasks. It will help you make sense of the myriad of similar software packages, translate the intricate complexities of software claims, understand the watershed breakthroughs in software development . . . and even have a bit of time left over to dematerialize a few aliens.

Perhaps most exciting, however, is that the pages of **Software Now!** will contain news about software for applications you've never even considered running on your computer. Imagine having an overview of the work of the world's most gifted program developers . . . and you'll have a good idea as to what this new publication is about.

**Software Now!** will be dealing with a broad range of systems and applications, encompassing eight, sixteen and thirty-two bit machines and software as diverse as video games, drafting systems and spreadsheets.

We've reached a level of development in microcomputer software wherein one needn't be a computer genius to apply a computer. In fact, one can operate a computer with only a bit more expertise than one needs to successfully make toast. The key that will unlock the power of your computer is the software you plug into it.

**The key to that software is understanding.**

**The key to understanding software is Software Now!**

### The Pedigree

**Software Now!** is published by Moorshead Publications, which also brings you Computing Now!, Electronics Today, Computers in Education and the Printout newsletter. It has been producing successful magazines in Canada since 1977.

Moorshead Publications is unique in the way it produces magazines. The expertise in applying microcomputers has allowed us to make virtually the entire process of publishing electronic. The editorial in the publications is created on word processing terminals and computer type set. All the financial planning is handled by computer, as is filing and list management. The company also

maintains an on line telecommunications computer to communicate with its readers.

The Editor of **Software Now!** is Steve Rimmer, who also edits Computing Now! In the first year of its existence Computing Now! went from a standing start to having over twenty two thousand subscribers, making it Canada's largest consumer microcomputer publication.

Steve has had experience with a wide range of software, from word processors to sophisticated music and graphics packages. He uses a number of computers, including several CP/M based machines, an IBM, an Apple II+, a Commodore and a MacIntosh.



# are W! ber 1984

## Features In The Queue

This is some of the editorial we have lined up for the first few issues of Software Now! You can expect it to change a bit... new software springs up almost daily, and Software Now! will always feature the most important developments in this dynamic field. Articles being developed during the preparation for the magazine include:

Computer Aided Drafting On a Micro • Techniques in MacPaint • How to choose a Spreadsheet • Apple Software Crate • Getting to the Root of UNIX • The Digital Research Pantry • A Thousand and One Word Processors • IBM's Productivity Family • Can Mac Write? • Professional Software Roundup • Power Programs for the 64 • Approaching the C • Word Processing Support Programs • dBase II Enhancements • Will it Run Multiuser? • Concurrent CP/M •

**Reviews:** 10 Base • Mighty Mail • WORD-BASE • Easy Script • Computer Chef • Electronic Circuit Analysis Program • Superex Retailer • MAI Basic Four • The Print Shop • TK!Solver • Microsoft BASIC for the Macintosh • Sundog • Turbo PASCAL for the IBM • AutoCAD • MultiMate • Lexicheck and Word Juggler • Dataflex • Symphony • Omniterm 2 • DB Master • Paint Magic.

In addition to this look for these regular features:

<b>The Library</b>	(Our monthly survey of books)
<b>By The Boards</b>	(Public domain software)
<b>Arcade</b>	(A blast at the latest games)
<b>Short File</b>	(A short overview of new releases)

## The Amazing Software Now! Software Disk Free to Charter Subscribers

At Moorshead Publications, we have always managed to launch new magazines with a flying start; this time we want our previous records to be smashed. We believe we have come up with "**an offer you can't refuse**".

The **Amazing Software Now! Program Disk** is, we believe, the best offer ever made to Charter Subscribers to a new magazine. A charter subscriber is one who helps provide the initial circulation base and we feel they deserve something special — what we are offering is just that.

The disk contains some fairly amazing custom written material:

- CalcNow:** A real spreadsheet program with many of the new features of programmes costing a small fortune. CalcNow is perfect for those who want to experiment with a spreadsheet and are dying to see how they work. It is far from a toy.
- DataBox:** A flexible data base manager and is a version of a program we developed for our own company use.
- Poker:** Life is not complete without a video game.
- Phone Jack:** A telecommunications terminal.

The contents of the disks vary depending on the system and additional programs come for some systems: see overleaf for a more complete description.

The **Software Now! Disk** is available in a huge number of different formats but we haven't forgotten you if you haven't got a disk drive or a system that we can accommodate: everyone will also receive a hard copy listing of those programs written in BASIC (listed for Microsoft Basic for you to modify yourself).

This disk will be sent to you **FREE** if we get your subscription order **before September 30th, 1984**. Early orders will get their disks as soon as processing and shipping time allow, later orders will receive them with the first copy of the magazine.

The **Software Now! Disk** is not available at this time **EXCEPT** to **Software Now! Charter Subscribers**. The software is currently in the final stages of development but we must reserve the right to modify the content.

Software Now! is available at a charter rate of **\$19.95** for a one year subscription, **\$34.95** for two years. This rate is valid until September 30th, 1984. This rate includes your choice of a free software disk... please specify the machine operating system and format you want the disk to run with: check those available.

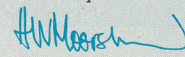
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If you do decide that Software Now! is not the magazine you expected or want, or if you decide to cancel your subscription for any reason or no reason, you may do so and receive a refund on the unexpired portion at any time.

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# The Amazing Software Now! Bonus Disk

The programs available on the disks are as follows:

Product	(kt)	Res	(1979)	PLA	PAH	PLAD	U	Tr	U	M	S
30: PS TOT/ONES			48				28				
31: PS INU/OLD NES			9.88				137	1.26		63	
32: (Prof:27 S In/old Misc)				27.58			137	1.26		75	
33: PSFORM ECG CORTING			7.38								
34:										44	
35: PSFORM ROOFING			6.78								
36: PSFORM BREATHING			5.58								
37: PSFORM STYRE NES			5.58								
38: (Prof:18 B Extr Foam)				18.00							
39: EPS INSULATION			16.00								
40: EPS KIT DRINK CUPS			5.78								
41: EPS PACK SHAPES			3.38								
42: (Prof:25 B EPS Foam)				25.00							
43: PSFORMS FLOOR WAVES			2.00							1	0
44:											
45: Total PS			126.38				16	1833		15	1
46: Resin exports			13.28				1	1833		2	1
47: Actual Mat Totals			126.28					38	16/2	0.7	
48:											
49: P Form:SUM(01:044)											
50:											

ITEM ENTRY PAGE

Record number ( 2 )

Name of Item (VIC 28 PROGRAMMER'S REFERENCE GUIDE )

Supplier's Code (VW118 )

Internal Code (CB81 )

Retail Price (23.58 )

Our Cost (28.00 )

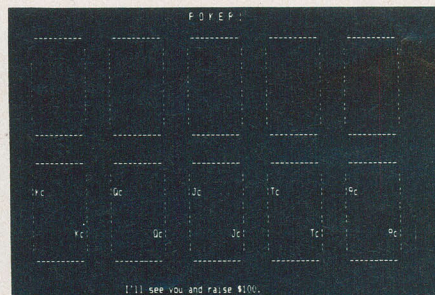
Profit Per Item (13.58 )

Maximum Inventory (25 )

Current Inventory (19 )

Minimum Inventory (15 )

Enter, New page or Abort: (E)



## CalcNow

CalcNow is a fully capable spreadsheet package. It can manage a sheet sixteen columns across by twenty six rows deep. It allows for automatic and manual recalculation, full cursor movement, formulae, constants and labels, disk storage of your sheets and a full hard copy reporting function. Its syntax and behavior is very much like that of the popular packages and for models of the size usually used in small business and personal financial planning it's equivalent to professional ... and very much more expensive ... spreadsheet packages.

## Phone Jack

Most computers have telecommunications hardware built into them ... it's a shame that they don't all have software available to drive it. This program does basic telecommunications and, while its features do vary a bit from system to system ... based on what the operating systems allowed us to implement ... it does provide for the basic requirements of calling computer bulletin boards and dial up mainframes.

## Utility Pack

Most revisions of the disk will also have a choice selection of utility programs. These vary a lot from system to system so it's a bit difficult to describe them all here. However, these are the little routines that make life so much easier when you sit down at the keyboard and switch on.

## DataBox

Many commercial data base managers are extremely powerful, extremely expensive and, in fact, grossly over qualified for most tasks. DataBox can handle most of their routine tasks that data base managers are bought for. It is efficient of disk space, reasonably fast and very, very flexible. It can keep track of your files, your stock ... or even your record collection. It features variable fields, hard copy reporting and flexible search parameters.

These programs will vary a bit from system to system ... the following outlines the formats in which we can supply this software. You will need your own Microsoft compatible suitable BASIC Interpreter (e.g. GWBASIC, BASIC-80, MBASIC, APPLESOFT, RS BASIC, PET BASIC, Microsoft Macintosh BASIC etc.)

**For CP/M\* users:** CalcNow, DataBox, Poker!, Utility Pack, Phone Jack

**For Apple II+DOS Users:** CalcNow, DataBox, Poker!, Phone Jack, Utility Pack plus Clef Hanger (An Apple Music Box), Skyhook (a teletype converter) and Fruit Crate (a BBS).

**For IBM Users:** CalcNow, DataBox, Poker!, Utility Pack, Phone Jack plus Bandit (A slot machine simulator)

**For Macintosh Users:** CalcNow, DataBox, Poker, Phone Jack and Letterhead (a stationary generator).

**For Commodore Users:** CalcNow, DataBox, Poker, Utility Pack and Phone Jack.

**For TRS-80 Model III and 4:** CalcNow, DataBox, Poker

## Poker!

We wanted to include a game on the disk and, after some deliberation decided that a good dimly lit, smokey card game would fill the bill best. This one simulates five card draw poker in the proper cowboy style. It can deal, draw, call, bet ... do everything but cheat and pull its six gun on a really bad hand. POKER! features a graphic display of the cards being played.

This software is available as a free gift to charter subscribers to Software Now! magazine. To be eligible to receive this disk your subscription order must be at our offices no later than September 30th, 1984.

\*Available for Apple CP/M, Osborne single and double densities, Access Matrix, Kaypro II, Lobo max 80, Morrow Micro Decision, Olympia single and double, Superbrain, Systel/Olympia, DEC VT-180, Nelma Persona, Xerox/Cromemco, 3R Avatar, Casio FP-1000, Epson QX-10VD, Attache, Micromate, i#800, Sanyo MBC 1000, Televideo, Zorba and on eight inch single sided single density disk.

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☐ Bill me (we are happy to bill you but you will NOT qualify for a Software Now! program disk).

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## Please Specify Your Disk Code as follows:

APP Apple II+ DOS  
IBM IBM PC  
MAC Macintosh  
TRS Radio Shack Models 3 & 4  
CBM Commodore Disk formats  
ACP Apple CP/M  
OS1 Osborne Single Sided  
OS2 Osborne Double Sided  
AMT Access Matrix  
KAY Kaypro  
LOB Lobo max 80  
MOR Morrow Micro Decision  
OL1 Olympia Single sided  
OL2 Olympia Double sided  
SBR Superbrain  
SYS Systel/Olympia  
DEC DEC VT-180  
NEL Nelma Persona  
XER Xerox/Cromemco  
3RA 3R Avatar  
CAS Casio FP-1000  
EPS Epson QX-10VD  
ATT Attache  
MIC Micromate  
SAN Sanyo MBC 1000  
TEL Televideo  
ZOR Zorba  
IF8 i#800  
8" 8" Disk Single Sided, Single Density



# TRS-2000

twenty kilobytes of data each. The basic fully stuffed 2000 has four available expansion slots... if you can afford one of these things, cards to plug up the slots should be child's play. The keyboard is much less weird than the Martian data entry module of the PC and its offspring, and humans trying to interact with it will find it to be a great deal better trip.

There are also a number of interesting gadgets and doo-dahs available for the Model 2000. You can get extra memory in one hundred and twenty eight kilobyte mouthfuls. The system will swallow the first one without even forsaking a card slot. The memory can be expanded to as much as a half megabyte.

Neatest of the accessories available for the Model 2000 is something called Digi-Mouse. Dig it... it thinks it's a Lisa. This plug in provides a cursor mouse similar to that found on the fancier Apple systems we've looked at over the past few months. It allows one to position the cursor anywhere on the screen with suitable software and do all manner of trendy manipulations.

The software library available for the Model 2000 through Radio Shack at the moment is not precisely huge... it's growing... and, if you wind up considering the thing it will be worth while to be sure you can get the applications you want working on it. There's PFS Write, Microsoft's Word and Multimate to process words on, PFS File, PFS Report and dBase II for keeping track of data, the Multiplan spreadsheet package, the MAI Basic four accounts system and Videotex Plus to do telecommunications. In addition, one can have Microsoft Pascal, BASIC, FORTRAN and COBOL compilers and a macro assembler to write stuff in.

## Out On The Streets

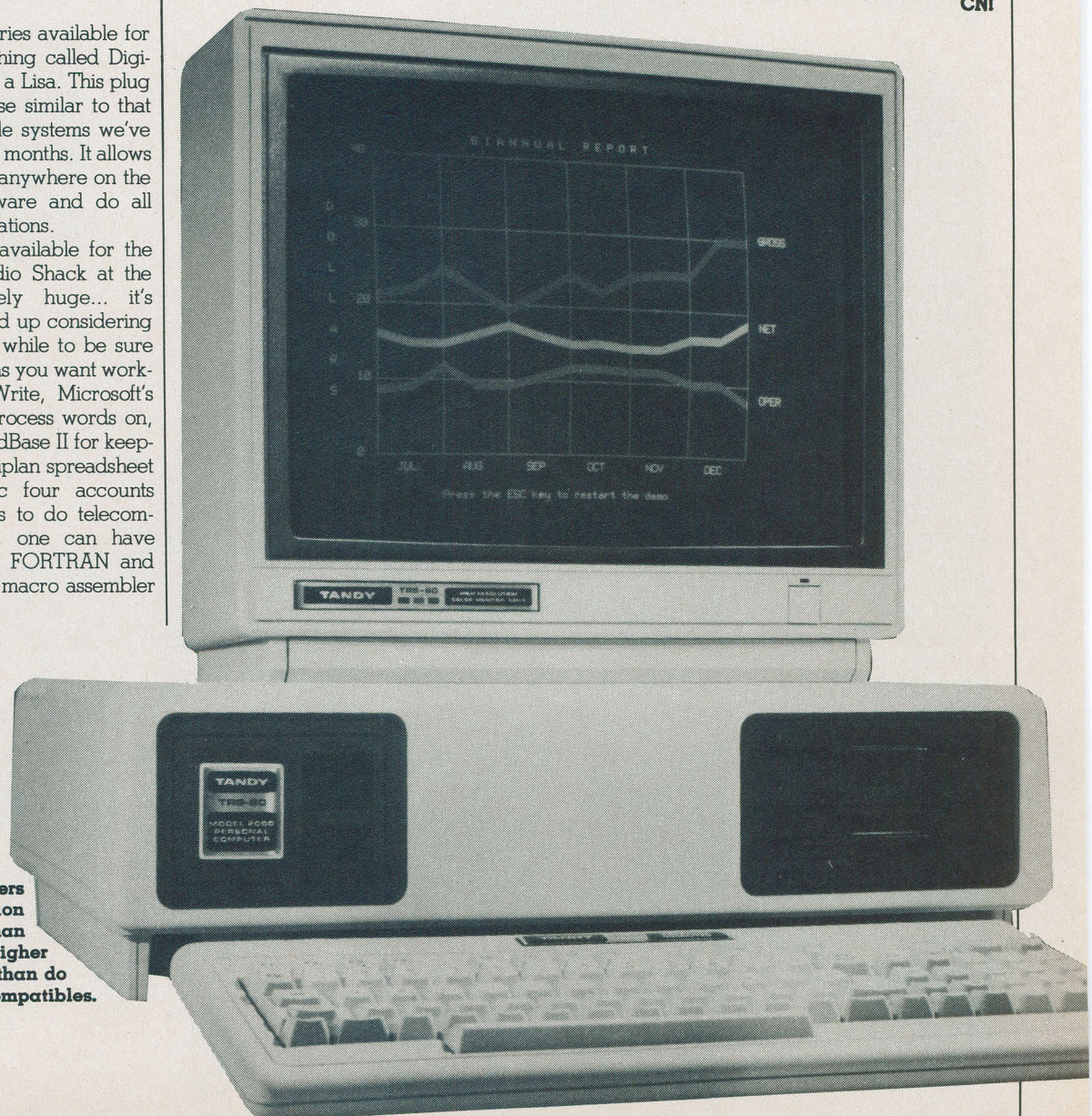
Perhaps the most important aspect of the Model 2000 is not what's in it but, rather, where it comes from. While the karma of the Radio Shack empire may or may not relate to your particular applications for micros, there are rather a lot of Shacks around. It's like a national high tech shanty town. Thus, the Model 2000, like other Tandy computers, is easy to come by, easy to get support for and easy to get fixed. Radio Shack's computer centre staff are pretty decent in answering tricky questions, and they don't seem to abandon last year's hardware when the latest new boxes hit the shelves.

It would be hard to say that the Model 2000 is the ideal system in the growing swell of IBM compatibles, semi compatibles, clones, work alikes, crash alikes and long lost best friends. However, it's a decent contender. It offers some technological advantages, a few software disadvantages and a fairly good infrastructure for support.

And... external demigods of the the nether newt farms be praised unto the sub-way. It isn't made out of dull, boring, eye stunning grey plastic!

It's made of duller, more boring, eye mangling white plastic. I wonder if it's biodegradable.

CNI



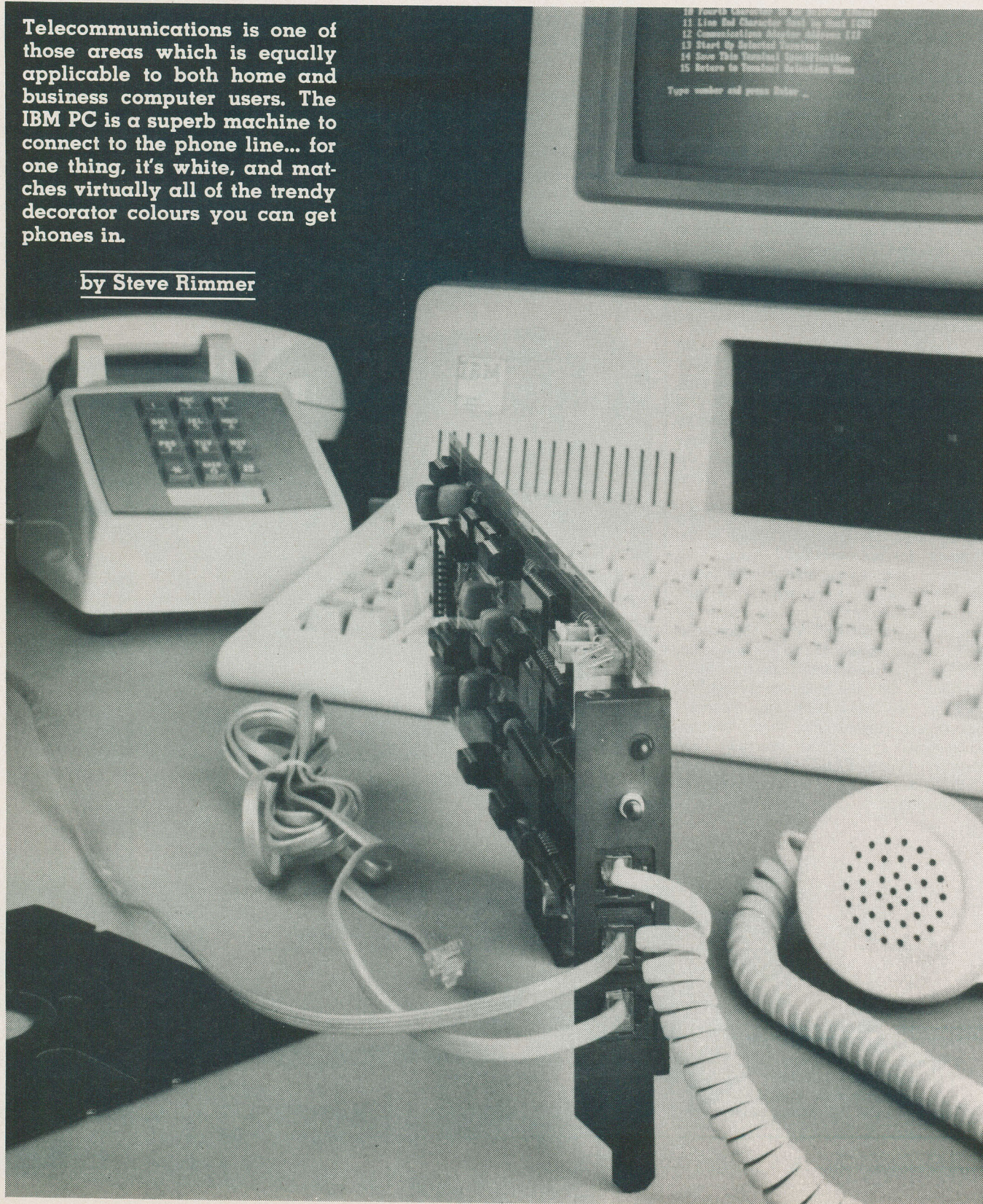
**The TRS2000 offers higher resolution graphics, a more human keyboard and higher density disks than do most IBM compatibles.**



# IBM Telecommunications

Telecommunications is one of those areas which is equally applicable to both home and business computer users. The IBM PC is a superb machine to connect to the phone line... for one thing, it's white, and matches virtually all of the trendy decorator colours you can get phones in.

by Steve Rimmer





**A**mong its other superlatives, the IBM PC has a lot of power stashed in its little corporate body to spew out over the phone lines. It can handle telecommunications at a number of levels, right from calling bulletin boards to accessing large mainframe timesharing systems. As with so much of this system, there's an amazing amount of juice to be squeezed from it... if you know where the pits are hiding.

A lot of what makes the IBM so powerful in this respect also serves to make it complex and a bit tricky to apply. We're going to look at what it can do in this feature... and a few of the spots to tickle so as to make it do its stuff. There's a fair bit involved in getting the blue beastie on line... both for home and business applications.

If Charlie could only have seen this...

## The French Connection

It's probably worth getting into a little bit of background before we plunge into the topic at hand. Users who are familiar with the principles of telecommunications can skip over this stuff... it should serve to put everyone else on an equally real astral plane.

If you look around the back of your PC you should find, buried amidst the printer port and the RGB connector, an RS-232 serial interface. Many compatibles use the same type of connector for the serial port and the printer port, so consult your manual for the likely time and space co-ordinates of the one in question.

As it has been since the beginning of time the serial port is brought out of the computer through a twenty-five pin D-shaped connector. It's worthwhile noting that, for a goodly number of applications, you can get away with using three of those twenty-five lines.

This connector allows you to interface your PC to things remote. Now, you may have several peripheral devices hanging off your PC as it is... a printer, a mouse, a plotter, an alien blaster ultra death grip joystick and any of a number of other serious business oriented cubes. However, all of these, because of the way they talk to your computer, are *local* peripherals. They have to be in the same room as the computer because the communications medium, that flat ribbon cable, is both too impractical and too unreliable to send stuff over for any distance.

If you doubt this consider the logistical problems involved in running a ribbon cable from Toronto to California. Other aspects include the hassle of the printer in California running out of paper.

A modem is also a local peripheral... but it interfaces your system to a communications medium, to wit, the phone lines, which is anything but. A modem, in its simplest sense, is simply a device which takes computer data fed into it and sends it out over the wire as beeps and bops that, being sound, can be handled by the hoary-scaled nether trolls of Ma Bell. At the same time, it will take said beeps and bops, such as that which has been emitted from another modem, and reconstruct the computer data which created them, so that the stuff spilled into the cruel world by a far off computer can be understood by yours.

This is a fairly complex process. The two modems must be able to send and receive characters and, more to the point, they must know when they can consider the data they have transmitted good... and when it's garbage. A properly functioning serial communications link only passes you the good stuff.

The way that valid data is... reasonably... assured over a serial link is by having both modems, and the computers attached to them, agree on how they will communicate. This agreement takes the form of a number of specifications for the data being sent, called the *protocol*. The protocol takes into account quite a few bizarre terms, and we're not going to get our minds too heavily blasted by it just now, as it's possible to telecommunicate quite successfully without ever worrying about most of it.

The speed at which you can send characters between modems is a function of the way the modems are built, which is, in turn, determined by how greasy the phone lines generally are. In the real world, it is imminently practical to send data at three hundred baud and you can just get it together at twelve hundred.

Now, I know you aren't just sitting there, perched on your U-Haul camel with a magazine in your hand killing time. You probably noticed that a couple of lines ago a new word kind of sidled its way into the conversation. The phrase *baud* is a telecommunications term which specifies the number of characters which can be sent in a given second.

Actually the baud rate specifies the number of *bits* which can be sent in a second. However, as it happens, the number of bits in a character is a largely constant thing in the sort of telecommunications we'll be getting into, so it also specifies the number of characters indirectly. Furthermore, the number of bits in a character is generally ten, an unusually convenient number, so that the number of characters sent in a second can be figured as a tenth of

the baud rate.

A transmission rate of three hundred baud amounts to text scrolling by at a bit less than the speed at which most people can comfortably read.

A modem which works at three hundred baud is, at the moment, extremely simple and cheap to build. As such, these things are fairly affordable... they start at around twenty-five dollars for the really basic ones, with quite sophisticated brutes selling for under three hundred dollars.

Twelve hundred baud communications is an awful lot nicer than the same stuff oozing by at three hundred baud. However, twelve hundred baud modems are much more sophisticated and, as such, cost quite a bit more, hovering about the five hundred dollar mark.

There are three other parameters in a protocol specification. These are the *parity*, the number of bits in a character and the number of *stop* bits. While vital numbers, and very good for slinging around at parties if you want to make lesser beings feel a bit Neandertal, these aren't really important in a general understanding of getting your serial communications hardware together. It happens that virtually all simple telecommunications is handled at a very limited selection of protocols, these being seven bit characters, even parity and one stop or eight bit characters, no parity and one stop.

It may be even more reassuring to know that these two standards are entirely compatible and, if you set up your PC for one you will be able to communicate with other systems supporting either.

The stuff that is hammered down the wire from your PC's serial interface is a collection of pulses or voltages going up and down very fast. Your modem will turn these into a series of tones which, if listened to through an extension phone will sound like a couple of cats making more cats. In fact, it is one tone which switches between two specific pitches very quickly... as often as ten times per character.

The tone is called a *carrier*... the last of the funny words we'll have to deal with for a time. Whenever two modems communicate they are each sending a carrier into the phone lines. The one which started the conversation will be sending an *originate* tone. The other will be doing an *answering* tone. These are at slightly different pitches so that the modems know when the data on the wire is their own and when it is coming from the other end.

The originating modem will only recognize data which appears on the answering carrier, and vice versa and so forth like that.



# IBM Telecommunications

## Hardware

As we noted earlier, modems are available in vast range of prices. Modems for the PC take two basic forms... you can get plug-in modems which are designed to be expansion cards for the IBM or you can have a stand alone modem, in its own private box, which interfaces to the machine through a serial port.

Let's consider these separately, beginning with the latter, as it's a bit less involved.

The basic function of a modem is to send and receive data... but this is not always all that simple. For one thing, you have to be able to contact the other computer... which means dialing the phone. Dials are very low tech and, so, the snobbier class of modems are able to handle it for you.

There are a number of ways to dial a phone if you wake up to find that you have mutated into a large white box with a picture tube for a face and two disk drives in your belly. The simplest way is to control the level of the phone line and synthesize the action of a rotary dial. This is called pulse level dialing. Many intermediately priced modems have a facility for doing this by setting the phone line to whatever level they sense on pin twenty-five of their RS-232C connectors.

Thus, all you have to do is to have your computer change the value of this line. It's a real drag that the serial interface of the IBM PC doesn't have anything connected to pin twenty-five and, hence, cannot use this lovely cheap dialing technique.

The other way to dial is by using a *smart* modem. The most common of these, and the one which is emulated by virtually all of the others, is the D.C. Hayes *Smart-Modem* which we had a look at in the last edition of *Computing Now!*. It doesn't require any special control lines but, rather, keeps an eye on the data going through it and looks for special codes which it recognizes as being commands to its small aluminum-encrusted self. As such, you can command it to dial if you send it the right stuff.

The command to make a smart modem dial would be

**ATAP 423-5149**

The *P* means to pulse dial... the thing can also dial with touch tones.

The simplest telecommunications arrangement for the PC, then, is to get an RS-232C connector cable and a modem and plug them into the serial port out back of your computer. If you get a low cost modem like the popular and always nasty EMP 101 manual mini modem you will not

be able to dial from the computer... popping for a more elite box will overcome this drawback.

The serial port which comes with most IBM compatible systems is based on a Western Digital 8250 chip... don't worry about what that is unless you're heavily into programming. However, it's important to note that virtually all of the other cards you can buy that add more serial ports to your system also use 8250's to drive them. This means that there is a lot of software compatibility in telecommunications software for the PC.

In addition to this, the serial port, or ports if you add more of them, can be assigned to what are called logical devices. These are referred to as COM1: through COM4:. Most of the higher level languages which support the IBM, most notably Microsoft's GW BASIC, allow you to treat these as you would other input/output devices like the printer and the disk drives. This allows one to write very sophisticated telecommunications software with very little effort wasted in digging into the nasty bits of the system.

Now, having an external modem plugged into the system's serial port has both advantages and disadvantages. I like external modems because I use a lot of different computers. However, they are relatively expensive, take up space and tie up the serial port which could otherwise be handling a mouse or a plotter. I would not be so foolish as to say that there are no peripheral cards available for the PC which only contain expansion serial ports... I would be immediately buried up to my neck in letters and left for the vultures, I'm sure... but it is fairly hard to find such things. Generally, you have to get additional ports as features on multi-function memory cards, an expensive process.

The other approach is to buy a dedicated IBM compatible modem card. These things are expansion cards which will look about the same as your present video card or memory board. Such a card will have all the circuitry of an external modem on it with a jack to plug the phone line into. It functions in the same way as would an external modem connected to the RS-232C interface, but the interface is built in.

These sorts of modems have no hassles with dialing or any of a number of other sophisticated telecommunications functions. In most cases they are designed to as to appear to the computer as serial ports and, as such, as logical COM: devices.

Our directory of paraphernalia, in this issue, lists a whole barrel full of these things.

## But Soft...

Let us now turn our attention to the software that makes telecommunications really do its thing. This can be approached on all sorts of levels, from very simple terminals right up to sophisticated communications packages and micro to mainframe links. We'll get to all of it in the fullness of time.

In order to make your modem talk to another computer you got to have a *terminal program* running on your PC. This can be extremely simple... all it really has to do is to take incoming characters from the serial port and display them on the screen and take outgoing characters from the keyboard and ease them out the serial port. It's also usually necessary to have the program establish to operating protocol.

Listing one is an example of a simple terminal package. It's written in assembler and will take the form of a COM file. It will set things up for three hundred baud communications and wait for characters from the outside world. Hitting control E will exit the terminal mode back to DOS.

It's interesting to note that you can write a similar program in Microsoft GW BASIC. The support for telecommunications therein is extremely good.

It is, of course, not necessary to write your own terminal program. There are a number of commercial ones available, such as *Crosstalk*, and several public domain ones, like *PC-Talk*. These packages give you terminal capabilities, of course, but allow you to do a great deal more with your modem.

The most apparent slickness in a sophisticated telecommunications package is the facility for dialing phone numbers. *PC-Talk*, for example, stores a list of numbers in an external disk file. You can call them to the screen and select one. The computer will dial it and wait for a carrier. If it gets one it will drop you into its terminal mode so that you can log onto the system you've reached. If it gets a busy signal you can instruct it to hang up and keep trying the number until it becomes free.

This bores the computer to tears but is a great deal kinder to your fingers.

These packages usually also allow for function key *macros*. This is a freaky term for user definable strings. You can instruct the package to store your name, for example, in a buffer, so that when you hit, say, F1, it would be transmitted automatically as if you had typed it. Since most remote systems want passwords and commands which remain relatively constant this can save you quite a bit of typing.

In many cases you will want to move large amounts of information between the





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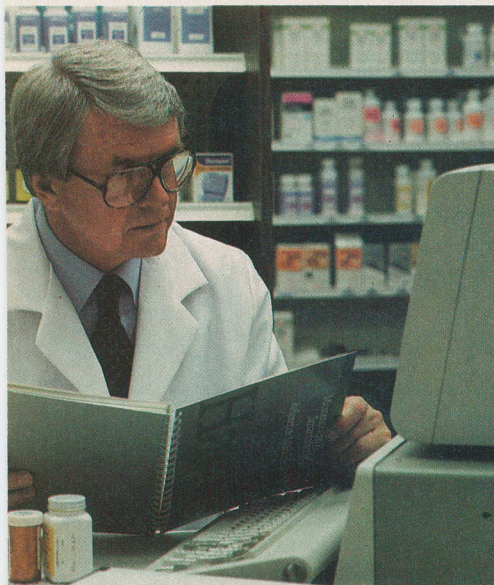
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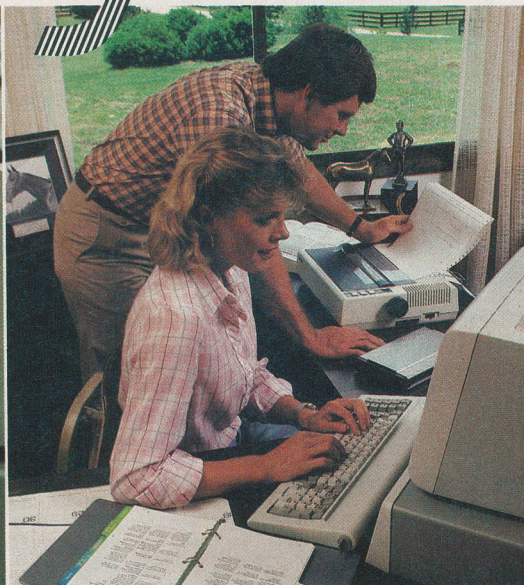
Circle No. 22 on Reader Service Card



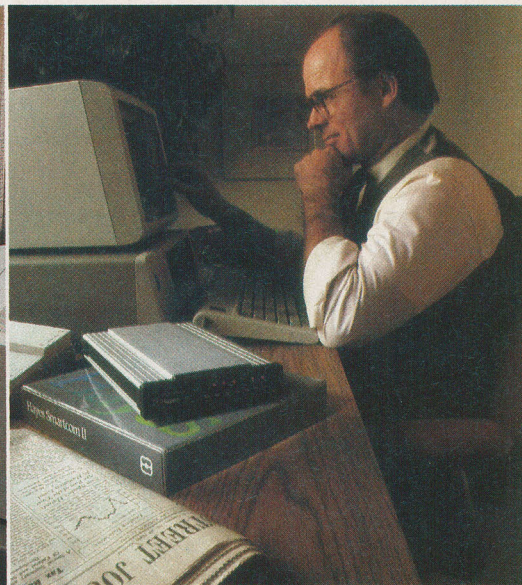
# Your computer's telephone. Hayes



What are the adverse effects of this compound?



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With Smartcom II, it is. Case in point: Before you communicate with another system, you need to "set up" your computer to match the way the remote system transmits data. With Smartcom II, you do this only once. After that, parameters for 25 different remote systems are stored in a directory on Smartcom II.

Calling or answering a system listed in the directory requires just a few quick keystrokes.

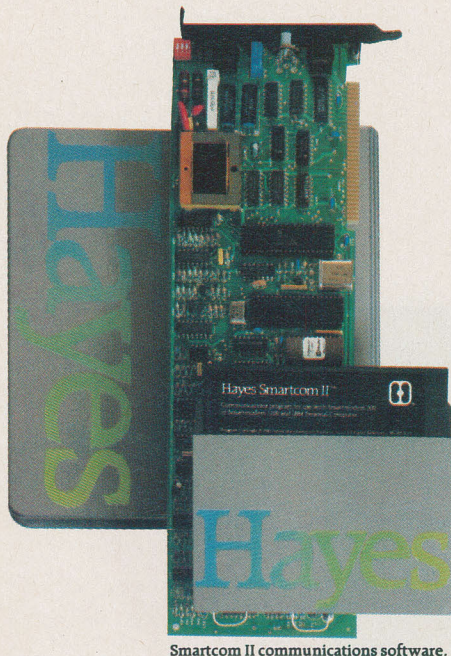
You can store lengthy log-on sequences the same way. Press one key, and Smartcom II automatically connects you to a utility or information service.



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No serial card or separate power source is needed.)



Smartcom II communications software.

NOTE: Smartmodem 1200B may also be installed in the IBM Personal Computer XT or the Expansion Unit. In those units, another board installed in the slot to the immediate right of the Smartmodem 1200B may not clear the modem; also, the brackets may not fit properly. If this occurs, the slot to the right of the modem should be left empty.

And, in addition to the IBM PC, Smartcom II is also available for the IBM Personal Computer XT, DEC Rainbow 100, Xerox 820-II, Kaypro II, Compaq Portable, Corona Portable PC, and Columbia MPC.\*

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## IBM Telecommunications

system you've called and your own. This is called file transfer, or *uploading* and *downloading*. There are a number of ways to achieve this, of which two are commonly found in PC telecommunications packages.

The simplest form of transfer is called an ASCII dump. This simply means that the sending system sends the file one character at a time, just as if it were displaying it for you to read. The only difference is that your terminal must be able to capture the characters and eventually save them to a disk file.

There are definitely limitations to this approach. To begin with... as you might have expected... you can only send ASCII files. COM and EXE files... programs... and BASIC files which have not been converted to ASCII would be irretrievably corrupted by this process. Furthermore, even ASCII files are not completely safe, as occasionally the phone company will take it upon itself to burp, trashing a few characters here and there.

A better way to do things is to send files over what is called a *protocol transfer*. The protocol that's normally used is really funky one called, at various times, MODEM7, XMODEM and the Ward Christensen transfer, after the head that came up with it. In essence, it sends a bit of stuff, checks that what it has sent has gotten to bed okay and then sends a bit more, repeating the dance until the whole file is completely transmitted. If it finds that it has sent some uncools it retransmits the block containing the corrupted data and the terminal at the far end replaces the bad block with the new one... making sure that it, too, hasn't gotten gorch-ed.

There are catches to this. In order for MODEM7 to work you have to have a compatible terminal package at *both* ends of the link. It also takes longer than a straight ASCII dump as the two systems are constantly patting each other on the back and comparing notes.

Finally, at the really sophisticated end of the high tech spectrum there is the rarified world of terminal emulation and micro to mainframe links. This is a topic all in itself, and one not lightly dealt with, so we're just going to have a peek at it here.

Terminals which are associated with mainframe computers are not that different from the sort of dumb terminals we talked about a while ago. In most cases they are not computers running terminal software but, rather, dedicated machines which can do nothing else.

It's important to realize, however, in talking about terminals that, while they send and receive characters in much the same

way as does a microcomputer pretending to be a terminal, they do other things in quite different ways. For example, terminals have special sequences of codes, called *escape sequences* to do things like clear the screen, position the cursor, turn on the highlighting, starting and stopping transmission and so on.

A mainframe computer is just a big box full of power which regards all of its peripherals as ports. This lumps all sorts of things like disk drives, printers and terminals into the same group. The computer can make no special effort to deal with any particular peripheral in a special way... the peripherals have to conform to the standards of the computer.

The mainframe which most business users are interested in connecting to is the IBM 3270. It, and systems which emulate its protocols, are found in quite a few timesharing applications. You may be renting time on one or inputting data to an accounts company or a large payroll or book-keeping house that uses one to do its thing. Many larger businesses use mainframes to handle their heavy data manipulations and have PC's on their employees' desks.

If you have a PC it's considerably cheaper to use it to take to mother than it would be to buy a dedicated terminal. Furthermore, you can use the computer as a data entry machine and dump what you've done to the mainframe to reduce the connect time to the larger system. This last factor is extremely powerful if you are paying for the thing by the minute.

There are a number of 3270 connection packages available. These are cards which plug into the PC just like plug-in modems. They provide the interface circuitry to support co-axial links between the PC and the mainframe in question, as well as software to emulate specific terminals.

A number of these devices are listed in our trusty directory of paraphernalia... we'll be giving them a more detailed look in an upcoming issue.

### Beat It Down The Line

Telecommunications isn't difficult on the IBM PC... although it may appear to be so, as there is such an abundance of options and capabilities built into the thing and about ten times as much to mull over if you start looking at hardware to add to the basic mess.

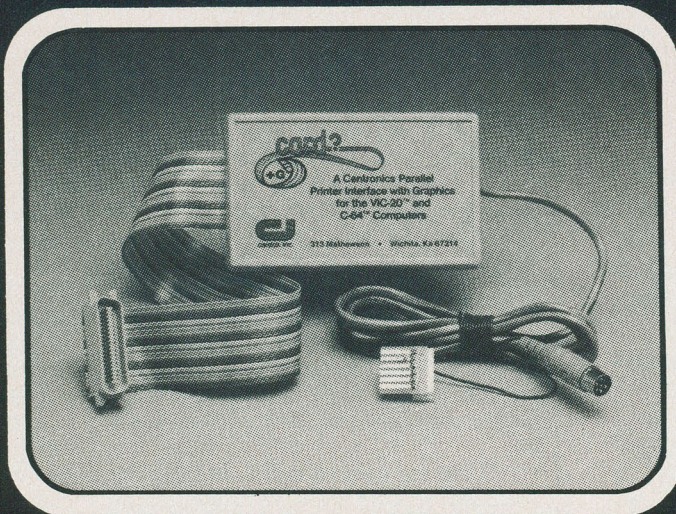
Whether you find yourself wrapped in a three piece suit or clad in slightly perforated Levis, telecommunications can make your PC considerably more powerful. It will allow you to access information far in excess of what can be obtained on disk. A catalog



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# IBM Telecommunications

## Listing One

```

;
; Blue Talk Telecommunications
; Terminal
;
; Copyright (c) 1984
; Steve Rimmer
;
; May be harmful to laboratory
; mice if dropped on them.
; .....
;
STACK SEGMENT PARA STACK 'STACK'
DB 256 DUP(0) ; AN OVERLY LARGE STACK
STACK ENDS ; I KNOW
;
DATA SEGMENT PARA PUBLIC 'DATA'
EXCHR EQU 'E'-40H ; CHARACTER TO EXIT
CR EQU 13
LF EQU 10
UR EQU 187 ; UPPER RIGHT CORNER
UL EQU 201 ; UPPER LEFT CORNER
LR EQU 188 ; LOWER RIGHT CORNER
LL EQU 200 ; LOWER LEFT CORNER
HB EQU 205 ; HORIZONTAL BAR
VB EQU 186 ; VERTICAL BAR
;
ONLN DB CR,LF,UL,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,UR
DB HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,UR
DB CR,LF,VB,' ',VB
DB CR,LF,VB,' Blue Talk V 1.05 ',VB
DB CR,LF,VB,' Telecom Terminal ',VB
DB CR,LF,VB,' ',VB
DB CR,LF,VB,' Copyright (c) ',VB
DB CR,LF,VB,' 1984 ',VB
DB CR,LF,VB,' Steve Rimmer ',VB
DB CR,LF,VB,' ',VB
DB CR,LF,LL,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,LR
DB HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,HB,LR
DB CR,LF,LF,LF,LF,LF,LF
DB 'On-line... hit control ',EXCHR+40H
DB ' to split',CR,LF,LF,LF,'$'
;
OFFLN DB CR,LF,'Blue Talk Off-line',CR,LF,'$'
DATA ENDS
;
CODE SEGMENT PARA PUBLIC 'CODE'
START PROC FAR
;
ASSUME CS:CODE
PUSH DS
MOV AX,0
PUSH AX
MOV AX,DATA
MOV ES,AX
ASSUME ES:DATA ; STANDARD OBIENCES TO
MOV DS,AX ; THE PC... OMM....
ASSUME DS:DATA
;
CALL INITMOD ; SET UP 300 BAUD
CALL CLS ; CLEAR THE TUBE
MOV DX,OFFSET ONLN
MOV AH,9
INT 21H ; PRINT HELLO MESSAGE
LOOP: MOV DX,3FDH
IN AL,DX ; GET THE MODEM STATUS
TEST AL,00000001B ; IF NO CHAR WAITING...
JZ LOCTER ; ... CHECK KEYBOARD
MOV DX,3F8H ; GET CHARACTER FROM MODEM
IN AL,DX
AND AL,7FH ; MASK PARITY
PUSH AX ; SAVE IT
MOV BX,0
MOV AH,14

```

```

INT          10H          ; OUTPUT IT TO TUBE
POP          AX           ; GET IT BACK
CMP          AL,CR        ; SEE IF ITS CR
JNZ          LOCTER       ; IF NOT, LOCAL STATUS
MOV          AL,LF        ; IF SO, OUTPUT LF
MOV          BX,0
MOV          AH,14
INT          10H

;
LOCTER: MOV    AH,01H      ; IS THERE A LOCAL
INT          16H          ; ...CHARACTER WAITING?
JZ           LOOP        ; IF NOT, LOOP
MOV          AH,00H       ; IF SO, GET THE...
INT          16H          ; ... CHARACTER IN AL
CMP          AL,EXCHR     ; SHALL WE DEPART?
JZ           EXIT        ; IF SO, GET LOST

;
MOV          DX,3F8H      ; SEND THE CHARACTER OUT
OUT          DX,AL
JMP          LOOP        ; AND LOOP FOR NEXT PASS

;
EXIT:  MOV     DX,OFFSET OFFLN
MOV     AH,9
INT     21H          ; SAY SO LONG
RET          ; BACK TO DOS

;
START  ENDP

;
;      +++ SUBMARINES +++
;
INITMOD PROC    NEAR
MOV     DX,3FBH
MOV     AL,80H      ; OPEN UP DLAB
OUT     DX,AL
MOV     DX,3F8H
BDLSB:  MOV     AL,80H      ; SET LOW ORDER DIV
OUT     DX,AL
MOV     DX,3F9H
BDMSB:  MOV     AL,01H      ; SET HIGH ORDER DIV
OUT     DX,AL
MOV     DX,3FBH
CFW:    MOV     AL,1AH      ; SET CFW
OUT     DX,AL
MOV     DX,3FCH
MOV     AL,00000011B ; SNUFF LOCAL LOOPBACK
RET
INITMOD ENDP

;
CLS     PROC    NEAR
MOV     CH,0
MOV     DH,24
MOV     AH,0
INT     10H
MOV     CX,0
MOV     BH,7
MOV     DH,24
MOV     DL,79      ; CLEAR THE SCREEN
MOV     AL,0
MOV     AH,6
INT     10H
RET
CLS     ENDP

;
CODE    ENDS
END      START      ; THAT'S ALL, FOLKS

```

of the sources of online data could easily displace every other word in this magazine.

The boys in the ad department would not be pleased.

We'll be looking at some specific implementations of all these profound toys in the next few issue of Computing Now!. In the meantime, plug it in, turn it on, dial it up and wait for the carrier. There's a world of screaming modems out there just waiting for you to fling 'em a few bits.



# CP/Mapper

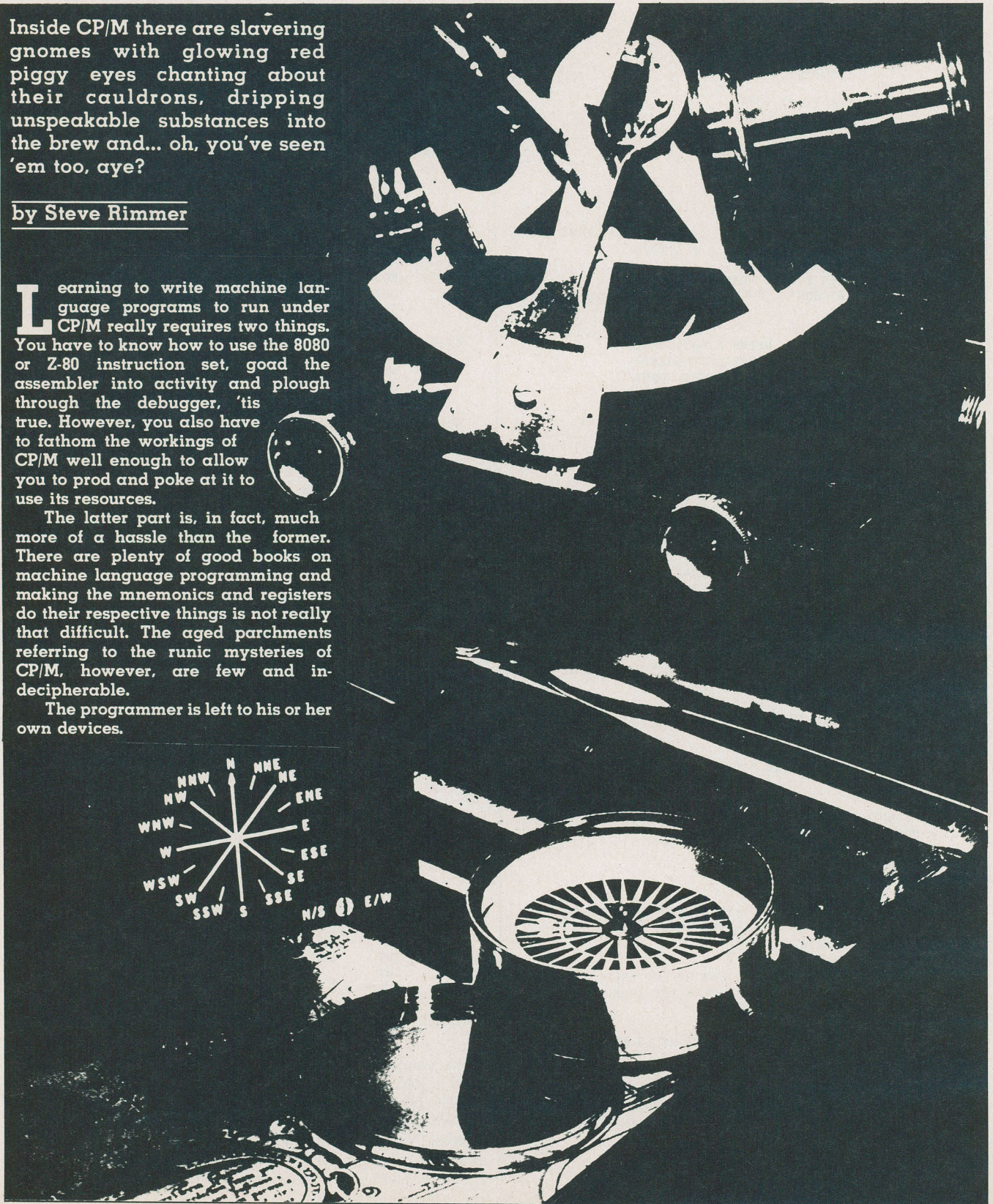
Inside CP/M there are slaving gnomes with glowing red piggy eyes chanting about their cauldrons, dripping unspeakable substances into the brew and... oh, you've seen 'em too, aye?

by Steve Rimmer

**L**earning to write machine language programs to run under CP/M really requires two things. You have to know how to use the 8080 or Z-80 instruction set, goad the assembler into activity and plough through the debugger, 'tis true. However, you also have to fathom the workings of CP/M well enough to allow you to prod and poke at it to use its resources.

The latter part is, in fact, much more of a hassle than the former. There are plenty of good books on machine language programming and making the mnemonics and registers do their respective things is not really that difficult. The aged parchments referring to the runic mysteries of CP/M, however, are few and indecipherable.

The programmer is left to his or her own devices.





This month we're going to have a dig through a program called the CP/Mapper. It's based on the observation that any given implementation of CP/M will tell you quite a lot about itself if you just know where to look. Much of the information one needs to write patches, hacks and programs that burrow into the internals of the operating system can, in fact, be gleaned programmatically.

Keep in mind that the utility of CP/M is based on all versions of it, being alike in those respects that matter to the programs that run on it.

The CP/Mapper will also provide us with an opportunity to scrutinize some additional examples of those three toed sloths of microcomputer programming, the macro calls. Introduced in the last issue, macros, as ye shall see, Billy, allow this program to be done up really slickly using rather less actual machine language level programming than one might expect.

## Map and Compass

As with the terminal program featured in the July issue of Computing Now!, the Mapper requires two files to assemble it. The first, the source code itself, refers to a non-specific collection of macros called BIGMAC.LIB.

The LIB, or library file, is a continuation of the one started last month. In fact, you have to have the one from June, as this program makes calls to it as well as to the new macros to be added to it, given in listing two. You can put this new code anywhere in BIGMAC.LIB you want to.

There are a number of aspects of the macro file which we didn't look at last month but which do become important in this application. To begin with, the file can contain all the customization code for your system. Anything which is terminal specific can be included in your macro definitions and thereafter never worried about again.

Consider, for example, the clearing of the tube... a vital function, this. Now, if you're writing code for a normal system that emulates an ADM-3... most business systems come fairly close to this... you would

**PRINT 26**

However, an Apple requires

**PRINT <ESC,""">**

Other systems that don't have specific clear screen codes can be made tractable by spewing out twenty-four linefeeds and a home character. The macro CLRSCRN holds whatever code your system needs to

make it do its stuff, and, once it's in place you can call it without having to think about what the escape sequence is for your machine.

Also moving up the charts of the top ten macros is DEFINES, a block which expands out into no bytes of code but handles all of the common labels one usually likes to assign to values. This thing can get really huge without creating any overhead at all in your program, as the assembler will just take those labels which are referred to in the program you happen to be working on.

Finally, this program deals with passing strings to the PRINT macro a little differently that we did last month. While the June article talked about passing them individually it is possible to tell MAC to combine several strings into one by putting arrowheads... lesser than and greater than signs... around them. Thus

**PRINT <CR,LF,'Electric Wombats',CR,LF>**

is equivalent to

```
PRINT CR
PRINT LF
PRINT 'Electric wombats'
PRINT CR
PRINT LF
```

but it expands out to vastly less code... as well as looking fiercely slick and high tech.

## Peeking Within

The display of the Mapper will present two pages of information about your system. The first one deals with things discernably from within the BIOS.

As we've noted in the past the BIOS, the part of CP/M which handles the system specific I/O, is a block of code which is pointed to by the warm boot jump at location zero. To look at this another way, if a program executes a JMP 0000 the next step before oblivion will be the third byte of the BIOS... generally another jump to the warm boot routine.

The first feature of the BIOS is the BIOS jump table, through which all communication between the CCP and the outside world must take place. We had a proper look at this in the October 1983 edition of Computing Now!. While it is impossible to know what is going on within the rest of the BIOS, this table will always be set up in exactly the same way.

The first part of the mapper program-matically locates the table and disassembles it. However, it also assigns labels to what it turns up, so it's easy to see where all the little gophers are hiding.

## Listing 1

```
.....
; CP/Mapper
; Copyright 1984 (c)
; Steve Rimmer
; Application of this program
; by frog farmers specifically
; prohibited
;.....
;
; ORG 0100H
;
; MACLIB BIGMAC ;INCLUDE MACRO DEFFINITIONS
;
; DEFINES ;INCLUDE STANDARD SYMBOLS
; INTRO ;PET THE STACK
;
; CLRSCRN ;CLEAR THE TUBE
PRINT <TAB,'CP/Mapper '>
PRINT <'Copyright 1984 (c) Steve Rimmer',LF>
PRINT <CR,LF,'The foot of the BIOS table is at '>
LHLD 0001 ;GET THE POINTER TO BIOS TABLE
MVI L,0 ;NULL OUT LOW ORDER BYTE
DECHEX ;SHOW THE VALUE
PUSH H ;SAVE THE POINTER 'TIL LATER
INX H ;POINT TO THE LOBBY... 1ST ENTRY
PRINT <CR,LF,LF,'The BIOS jump table is as follows:'>
PRINT <CR,LF,LF,'Cold boot JMP '>
CALL LOAD ;GET AND SHOW THE VALUE
PRINT <CR,LF,'Warm boot JMP '>
CALL LOAD ;GET AND SHOW THE VALUE
PRINT <CR,LF,'Console Status JMP '>
CALL LOAD ;ETC AND SO ON
PRINT <CR,LF,'Console Input JMP '>
CALL LOAD ;AND LIKEWISE
PRINT <CR,LF,'Console Output JMP '>
CALL LOAD ;AND LIKE THAT
PRINT <CR,LF,'List JMP '>
CALL LOAD ;AD INFINITUM
PRINT <CR,LF,'Punch JMP '>
CALL LOAD ;WINDING INTO ETERNITY
PRINT <CR,LF,'Reader JMP '>
CALL LOAD ;UNTIL FINALLY
PRINT <CR,LF,'Home disk JMP '>
CALL LOAD ;THE WHOLE AND COMPLETE
PRINT <CR,LF,'Select Drive JMP '>
CALL LOAD ;TABLE IS LYING,
PRINT <CR,LF,'Select Track JMP '>
CALL LOAD ;NAKED BEFORE THE
PRINT <CR,LF,'Select Sector JMP '>
CALL LOAD ;COLD STEEL EYES OF
PRINT <CR,LF,'Set DMA JMP '>
CALL LOAD ;THE SLAVERING MARTIAN
PRINT <CR,LF,'Read Sector JMP '>
CALL LOAD ;OVERLORD. "ATTACK THE
PRINT <CR,LF,'Write Sector JMP '>
CALL LOAD ;EARTH..." HE COMMANDS
PRINT <CR,LF,'List Status JMP '>
CALL LOAD ;"XLATE THEIR SECTORS"
PRINT <CR,LF,'Sector Xlate JMP '>
CALL LOAD ;"XLATE?" INQUIRES MAX.
;
PRINT <CR,LF,'Hit any key to continue',CR>
CONIN ;GET A CHARACTER
POP H ;GET BIOS POINTER BACK
CLRSCRN ;SANCTIFY THE VIDEO
PRINT <CR,LF,'The start of the CCP is at '>
LXI D,0000H - 1600H ;MOVE DOWN 16H PAGES
DAD D ;SUBTRACT 1600H
DECHEX ;SHOW IT TO THE UNIVERSE
PUSH H ;GET H OUT OF HARM'S WAY
INX H ;POINT TO FIRST JUMP
PRINT <CR,LF,'The first CCP jump is JMP '>
CALL LOAD ;GET IT AND FLASH
PRINT <CR,LF,'The second CCP jump is JMP '>
CALL LOAD ;LIKEWISE AND VERILY AGAIN
POP H ;GET H AND SAVE IT
LXI D,0006 ;POINT TO BUFFER LENGTH BYTE
DAD D ;BUMP H
MOV A,M ;SNATCH THE BYTE
LXI H,0 ;CONFUSE H SO AS TO GET A...
MOV L,A ;...PROPER DECIMAL DISPLAY
PRINT <CR,LF,'The maximum command length is '>
DECOU ;DISPLAY BYTE
PRINT ' characters.' ;SOPHISTICATEDLY
;
POP H ;PUSH H ;GET THE POINTER
LXI D,0000H-0100H ;GET OFFSET OF TPA
DAD D ;PUNCH OUT HL
PRINT <CR,LF,'There are '>
DECHEX ;AND SHOW BLOODY RESULTS
PRINT ' bytes of useable RAM available.'
;
PRINT <CR,LF,LF,'The logical devices are as follows:'>
PRINT <CR,LF,'The console assignment is '>
LDA IOBYTE ;GET IOBYTE (STUPID GIT)
LXI H,IOCON ;POINT AT TABLE (IMPOLITE)
CALL IOLOOK ;SHOW RESULTS
;
PRINT <CR,LF,'The reader assignment is '>
LDA IOBYTE ;SEIZE IOBYTE AGAIN
RRC ! RRC ;ROTATE DOWN TWO BITS
LXI H,IOHDR ;POINT TO TABLE (FAUX PAS)
CALL IOLOOK ;FLASH IT
```



# CP/Mapper

```

PRINT <CR,LF,'The punch assignment is '>
LDA IOBYTE ;WHAT... AGAIN
RRC ! RRC ! RRC ! RRC ;ROTATE DOWN 4 BITS (50c)
LXI H,IOPUN ;PAW THE TABLE ONCE MORE

CALL IOLOOK ;SEE WHAT HAPPENS

PRINT <CR,LF,'The list assignment is '>
LDA IOBYTE ;THE LAST GRAB
RRC ! RRC ! RRC ! RRC ! RRC ! RRC ;6 BITS
LXI H,IOLST ;LAST PLANK IN THE TABLE
CALL IOLOOK ;VIEW IT

PRINT <CR,LF,LF,'This is CP/M version '>
MVI C,0CH ;RETURN VERSION IN HL
CALL BDOS ;WITH A BDOS CALL
MOV A,H ;MP/M RETURNS 20H IN H
CPI 0 ;IS IT CPM?
CNZ MPH ;OVERPRINT IF MP/M
MOV A,L ;CP/M RETURNS NUMBER
PUSH PSW ;IN HEX IN L
ANI 11110000B ;HIGH NYBBLE MASK
RRC ! RRC ! RRC ! RRC ;ROTATE TO LOW NYBBLE
HEXNYBL ;SHOW IT ON THE TUBE
POP PSW ;GET A BACK
PRINT '.' ;PRINT DECIMAL POINT
ANI 00001111B ;LOW ORDER NYBBLE
HEXNYBL ;SHOW IT ON THE TUBE

PRINT <CR,LF,LF,'The built in commands are as follows:'>
POP H ;GET POINTER TO CCP
LXI D,0310H ;OFFSET FOR BUILT INS
DAD D ;ADD TO H
PRINT <CR,LF,'Disk directory '>
CALL ENTRY ;PRINT THE FOUR BYTES
PRINT <CR,LF,'Erase a file '>
CALL ENTRY ;FOUR MORE BYTES
PRINT <CR,LF,'Type a file '>
CALL ENTRY ;FOUR MORE BYTES... QUITE THE
PRINT <CR,LF,'Save memory in a file '>
CALL ENTRY ;... MOUTHFUL
PRINT <CR,LF,'Rename a file '>

```

```

CALL ENTRY ;FOUR MORE BYTES MORE
PRINT <CR,LF,'Change user area '>
CALL ENTRY ;AND ONE LAST TIME

PRINT
PRINT <'Hit any key to continue',CR>
CONIN ;SNATCH A CHARACTER
CLRSCRN ;PUZZ THE TUBE, CHUCK

EXTRO 60 ;END AND LOCAL STACK

ENTRY: ;PRINT BUILT IN COMMAND
PBUFF 4 ;PRINT THE BUFFER
LXI D,0004 ;ADD FOUR
DAD D ;...TO POINTER
RET

MPM: ;HANDLE MP/M VERSION
PRINT <CR,'This is MP/M version '>
RET

IOLOOK: ;DISPLAY THE IOBYTE STATUS
LXI D,-25
DAD D
ANI 00000011B
INR A
MOV B,A
LXI D,25
IOLOOP DAD D
DCR B
JNZ IOLOOP ;FALL THROUGH TO PSTR
PSTR
RET

LOAD: ;GET VALUE POINTED TO BY HL, DISPLAY
PUSH H
MOV E,M
INX H
MOV D,M
XCHG
DECHEX

```

```

XCHG
POP H
PRINT 'In location '
DCX H
DECHEX
LXI D,4
DAD D
RET

; IO BYTE DECODE... 25 CHRS EACH
IOCON DB 'TTY: Paper printer ',0
DB 'CRT: Video display ',0
DB 'BAT: Batch device ',0
DB 'UC1: User defined device ',0
IORDR DB 'TTY: Paper printer ',0
DB 'RDR: High speed reader ',0
DB 'UR1: User defined reader ',0
DB 'UR2: User defined reader ',0
IOPUN DB 'TTY: Paper printer ',0
DB 'PUN: High speed punch ',0
DB 'UP1: User defined punch ',0
DB 'UP2: User defined punch ',0
IOLST DB 'TTY: Paper printer ',0
DB 'CRT: Video display ',0
DB 'LPT: Line printer ',0
DB 'UL1: User defined list ',0
END

```

## Listing 2

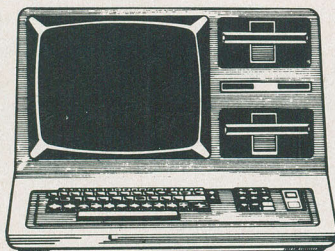
```

PSTR MACRO
;PRINT STRING IN H TIL NUL
LOCAL PSLP, ENDPS
PSLP MOV A,M
CPI 0
JZ ENDPS
TYPE
INX H
JMP PSLP

```

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```

ENDPS ENDM
;
DECHX MACRO ADDR
;SHOW H IN HEX AND DECIMAL
IF NOT NUL ADDR
LHLD ADDR
ENDIF
PUSH H
HEXOUT
PRINT 'H ('
POP H ! PUSH H
DECOUT
PRINT ') '
POP H
ENDM

;
INTRO MACRO
;SET UP STACK
LXI H,0 ! DAD SP ! SHLD STACK
LXI SP,STACK
ENDM

;
EXTRO MACRO STKSIZE
;RESTORE STACK
LHLD STACK ! SPHL ! RET
IF NOT NUL STKSIZE
DS STKSIZE
STACK DS 2
ENDIF
ENDM

;
PBUFF MACRO LEN
;PRINT NUMBER OF CHRS IN B, START IN H
LOCAL PBLOOP
SAVER
IF NOT NUL LEN
MVI B,LEN
ENDIF
PBLOOP MOV A,M
TYPE
INX H
DCR B
JNZ PBLOOP
RESTR
ENDM

;
DEFINES MACRO
;COMMONLY USED
CR EQU 'M'-40H
LF EQU 'J'-40H
BEL EQU 'G'-40H
BRK EQU 'C'-40H
BS EQU 'H'-40H
TAB EQU 'I'-40H
EOF EQU 'Z'-40H
NULL EQU 0
BDOS EQU 0005H
DMA EQU 0080H
TPA EQU 0100H
FCB EQU 005CH
IOBYTE EQU 0003H
ESC EQU 27
ENDM

;
CLRSCRN MACRO
PRINT EOF
ENDM

;
HEXOUT MACRO ADDR
;DISPLAYS THE HL REGISTER IN HEX ON THE TUBE
IF NOT NUL ADDR
LHLD ADDR
ENDIF
SAVER
MOV A,H
HEXBYTE
RESTR
SAVER
MOV A,L
HEXBYTE
RESTR
ENDM

;
HEXBYTE MACRO
;DISPLAYS THE A REGISTER IN HEX ON THE TUBE
PUSH PSW ! ANI 1111000B

```

```

RRC ! RRC ! RRC ! RRC
HEXNYBL
POP PSW ! ANI 00001111B
HEXNYBL
ENDM

;
HEXNYBL MACRO
;DISPLAYS A NYBBLE IN A IN HEX ON THE TUBE

```

```

LOCAL ENDNYB, HEXTBL
LXI H,HEXTBL ! LXI D,0000H ! MOV E,A
DAD D ! MOV A,M
TYPE
JMP ENDNYB
HEXTBL DB '0123456789ABCDEF'
ENDNYB ENDM

```

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# arkon



# CP/Mapper

It's probably worth noting that if you run the mapper on an Apple you'll get a fairly unreal looking jump address for the list status entry in the table. In fact, this is because the Microsoft BIOS does not support this function and there is thus no jump in there. Instead it does an XRA A and a RET and bounces back to the caller.

The CCP mapper is a bit more interesting as it dives foaming into the churning bytes of the command processor and extracts what bits therein lie. There's actually quite a lot to be learned from this part of things.

The CCP lies 16H pages below the BIOS. This is very easy to do in hex... you get the pointer to the BIOS in HL, make the L part zero to get to the next lowest even page boundary and subtract 1600H. This will point to the first byte of the CCP and one byte up from the highest location in the system's memory that's usable for transient programs.

There are two jumps at the start of the CCP... they determine whether or not the resident console command will get processed. Yes, that does sound like techno-babble, doesn't it... the resident command is whatever is in the console buffer.

We would have gotten to the console buffer in the fullness of time given half a chance, but, having forced the issue, immediately after the two jumps is a buffer. The first byte is the maximum length of the buffer... this ranges from eighty to a hundred and twenty-seven characters in most normal versions of CP/M. The next byte tells us the number of characters in the buffer right at the moment and the remaining bytes are supposed to hold a string that works out to be the name of a file or other executable phenomena under CP/M.

There's a better explanation of the in the June 1983 edition of *Computing Now!* in a feature called *CP/M in Ties*.

Knowing where all this stuff is can be handy for writing small patches. The hundred and twenty-seven byte buffer is way longer than any console command is likely to need and it's quite forgivable to shorten it considerably. Thereafter one can stick code in behind the buffer without fear of its getting walked on.

The Mapper, of course, will locate all the things you have to hack.

This page also contains code to display the setting of the almost useless Intel IOBYTE. You probably are only vaguely aware of what this is and, unless you like anachronisms, probably don't particularly care.

The IOBYTE allows one to easily associate... or, in kumputertok, *map*... the

logical I/O devices, like LST:, PUN:, RDR:, and so on, to the physical devices which may be supported by the BIOS, like the video display, the printer and, if you have a really sophisticated implementation, the cat.

In fact, most BIOS's take up so much space just doing reasonable disk functions that the IOBYTE is only partially implemented, if at all. However, it's still useful for doing things like making the computer think that your video display is really the printer port for debugging hard copy programs and suchlike.

There are four logical devices, CON:, LST:, PUN: and RDR:, and four each possible physical devices to which these can be assigned. These are whatever the BIOS says they are, so, for example, the BIOS for my TRS-80 Model II has the TTY: paper printer device driving the video display. This is actually a badly done implementation, but it serves to illustrate that all of this mapping stuff is conceptual.

You can actually read the IOBYTE with STAT, but the Mapper includes it with the other functions... this is a simple example of how to work with the little bit bug.

Finally, it's worthwhile to note that, while the structure of the CCP *could* vary from system to system beyond the console buffer it actually doesn't... all least for standard CP/M. Thus, it's possible to locate some of its other internal features if one wants to. The most visible is the table of built-in commands, which is 0310H bytes from the start of the CCP. What's more, these always live in the same order and can be displayed.

This may seem unimportant, as the commands are written down in the manual fairly clearly... an unusual thing for Digital Research... but being able to look at the commands is a splendid experience if you decide you want to change their names.

If you longed, for example, to have DIR invoke a sorted directory program you would have to change the string DIR in the CCP to keep CP/M from executing its own built-in command and ignoring your own.

## Chart Your Course

The Mapper is a useful programmer's tool and a good illustration of some further techniques in macro programming. For one thing, it should get your head into how much easier it is to use these things than it would be if you had to do everything in assembler. This program would expand out to a straight assembler file of about fifty kilobytes if you unpacked all the macros where their calls are.

The new macros are all fairly low level things. PSTR prints a string pointed to by

HL and terminated by a zero. PBUFF prints a string pointed to by HL but with its length specified either as a parameter or passed in the B register.

INTRO and EXTRO set up and then restore the stack. If you pass EXTRO a value it will set up a buffer for the local stack as well. This saves typing in these eight lines of code for every program you write... they're pretty well always used.

The HEXOUT macro is interesting in that it explains the nature of hexadecimal notation very clearly. A sixteen bit hex number, or a *word*, is two eight bit bytes which are each two four-bit nybbles. Thus, HEXOUT, which displays a word on the tube in hexadecimal, consists of two calls to HEXBYTE which in turn does two calls to HEXNYBL... this latter routine outputs one of the nybbles as a character each time it is expanded.

The HEXBYTE and HEXNYBL macros could have been subroutines within the macro, of course, making it a bit smaller. However, doing it this way allows them to be accessed as separate macros. The HEXNYBL macro is called in the part of the mapper that decides what version of CP/M it's running in.

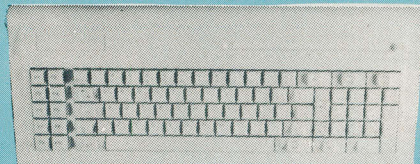
Writing with macros doesn't produce particularly tight code but it does reduce the development time involved in getting a program out of the sawdust by an order of magnitude. In most cases one doesn't care whether a utility is a few K bigger or smaller... just so long as it works.

Of course, macros can invoke other macros... which can, in turn be invoked by still more macros. There's the beginning of a structure here...

Yes, that's it... the *ubermacro*. The whole program could be one line long... just a single macro call and the twelve zillion parameters you have to pass it to tell it whether to be a database or a chess program.

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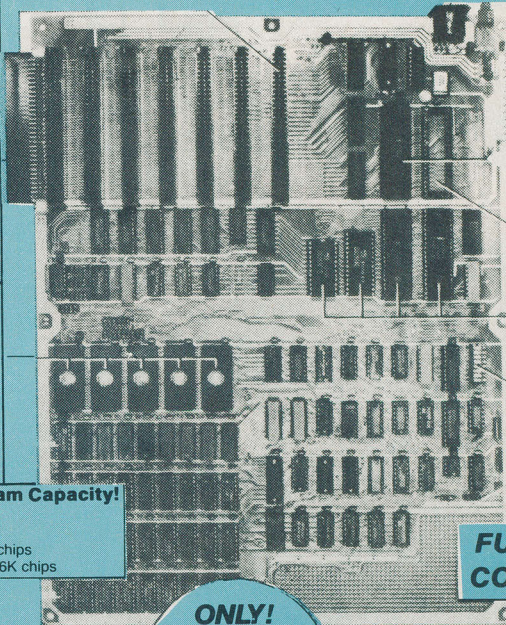
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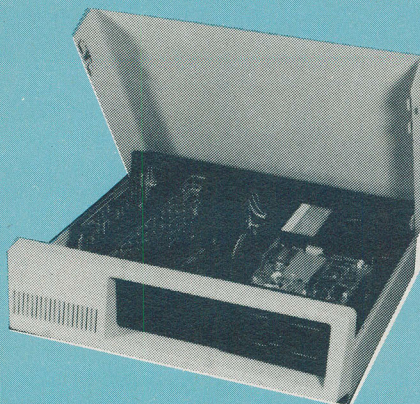
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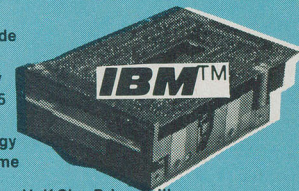
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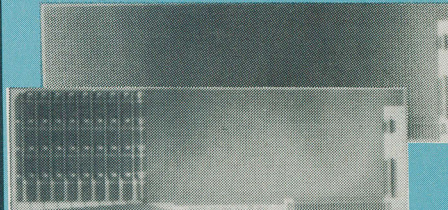
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A black and white photograph of a hand reaching upwards, with the index finger pointing towards a bright, jagged lightning bolt that strikes it. The background is dark and textured.

# Opening The Magic Window

Making the Gemini printers compatible with the popular Apple Magic Window word processor is an ordeal. The author of this feature spent several months in a lotus position with a copy of "A Thousand and One Popular Mantras" chanting his brains out after he got all the codes figured.

by Russ Spencer

**T**he Gemini 10 and 10X printers are advertised as working essentially like the Epson machines they're patterned after. If you've bought one and played with it for a while you'll probably have found that they don't... at least, not exactly. Unfortunately it takes a very minor diversion from the accepted control sequences to make communication between one's computer and one's printer a bit tense.

That of the Gemini and the popular Magic Window word processing package on the Apple is similar in tone to a sit down dinner with Ronald Reagan and Billy Carter. While you can send text to the printer well enough many of the control codes do strange things... or nothing at all.

Things are not entirely bleak, however, because the Magic Window package can be made to work with the Geminis. It just takes a bit of understanding of the workings of these low cost machines.

## Shutters

If you use an Apple or a clone thereof and Magic Window or Magic Window II you will probably want to be able to use all the available features of both your word processor and your printer. The Gemini will handle double strike, underlining and super and subscripts plus a whole range of lesser used effects. The Magic Window manual maintains that you can, in fact, access all this using control B and some fairly complex character sequences.



Further hopeful noises along these lines can be found in the files EPSON A and EPSON B on the Magic Window disk. However, if you print these out you'll probably find that they don't turn out on paper the way you might have expected them to. The charts don't look particularly neat and, for example, everything that should be a subscript is done in superscript.

If you experiment with the Gemini for a while you'll discover that there are quite a number of discrepancies between its actual operation and what the Epson files say it should be doing. For instance, the Epson subscript control sequence will turn on the subscripts... irrevocably. Likewise, the double width can be turned on but not off. You may also wind up in graphics mode. The superscripts seem lost entirely.

None of the dip switches on the printer will do you the least bit of good. Neither will the manual, which doesn't mention Epson printer codes at all. Many Gemini owners have come to this point and reached the inescapable conclusion that Epson compatibility was something that the importers dreamed up rather than the engineers having designed it in.

If you dig through the manual long enough you can figure out the codes that will drive the Gemini... but it isn't easy. The manual talks about CHR\$ values which don't translate easily into control B sequences from Magic Window.

The following are some of the more used sequences available on the Gemini as expressed in something Magic Window will relate to. With this sacred information you should be able to coax the full power of your Gemini onto paper... including block graphics and foreign characters and symbols.

Let's begin at the beginning. If you plan to make more than one copy of your work it's a good idea to initialize your printer before each new copy. If you don't you're apt to find that escape sequences from your first print out have been carried over to your next, often with unwanted effects which may not show up till you're half through printing. You can initialize the Gemini in one of two ways.

The most barbaric is to simply turn the printer off then on again after each copy is printed... something of a drag. You may even hang Magic Window using this method and eventually you're sure to forget to do it. Fortunately you can get considerably more sophisticated than this because the Gemini allows for a *software* reset. At the beginning of your first page type control B escape @. The screen will display "[@". As with all control B se-

	TURN ON	TURN OFF
<b>PITCH COMMANDS</b>		
PICA, Normal (10 CPI)	CNTRL-B ESC B CNTRL-B A	
ELITE, Elite (12 CPI)	CNTRL-B ESC B CNTRL-B B	CNTRL-B ESC B CNTRL-B A
CONDENSED, Condensed (17 CPI)	CNTRL-B ESC B CNTRL-B C	CNTRL-B ESC B CNTRL-B A
DOUBLE-Width (5 CPI)	CNTRL-B ESC W CNTRL-B A	CNTRL-B ESC W CNTRL-B SPACEBAR
DBL-WIDTH Elite (6 CPI)	CNTRL-B ESC W CNTRL-B B	CNTRL-B ESC W CNTRL-B A
	CNTRL-B ESC W CNTRL-B B	CNTRL-B ESC W CNTRL-B A
	CNTRL-B ESC W CNTRL-B A	CNTRL-B ESC W CNTRL-B SPACEBAR
	CNTRL-B ESC B CNTRL-B C	CNTRL-B ESC B CNTRL-B A
DBL-WIDTH Condensed (8.5 CPI)		
<b>MODE COMMANDS</b>		
NORMAL, Normal		
EMPHASIZED, Emphasized	CNTRL-B ESC E	CNTRL-B ESC F
DBL-STRIKE, Double-strike	CNTRL-B ESC G	CNTRL-B ESC H
ITALICS, Italics	CNTRL-B ESC 4	CNTRL-B ESC 5
UNDERLINED, Underlined	CNTRL-B ESC - CNTRL-B A	CNTRL-B ESC - CNTRL-B SPACEBAR
SUBSCRIPTNORMAL superscript	CNTRL-B ESC S CNTRL-B SPCBAR	CNTRL-B ESC T
SUBSCRIPTNORMAL subscript	CNTRL-B ESC S CNTRL-B A	
<b>LINE FEED COMMANDS</b>		
NORMAL LINE SPACING (66 L/Page)	CNTRL-B ESC 3 CNTRL-B X	CNTRL-B ESC 3 CNTRL-B X
CRAMMED SPACING (75 L/Page)	CNTRL-B ESC 3 CNTRL-B U	CNTRL-B ESC 3 CNTRL-B X
CRAMMED SPACING (83 L/Page)	CNTRL-B ESC 3 CNTRL-B S	CNTRL-B ESC 3 CNTRL-B X
BLOCK GRAPHIC LINE SPACING	CNTRL-B ESC 3 CNTRL-B L	
<b>SPECIAL COMMANDS</b>		
INITIALIZE	CNTRL-B ESC 0	
BACKSPACE	CNTRL-B H	
DISABLE PAPER-OUT DETECTOR	CNTRL-B ESC 0	CNTRL-B ESC 9
BLOCK GRAPHICS & SPECIAL CHARS	CNTRL-B ESC >	CNTRL-B ESC =
FOREIGN CHARACTERS	CNTRL-B ESC 7 CNTRL-B ?	CNTRL-B ESC 7 CNTRL-B SPACEBAR
UNI-DIRECTIONAL PRINTING	CNTRL-B ESC U CNTRL-B A	CNTRL-B ESC U CNTRL-B SPACEBAR
SLASHED 0 (GEMINI 10 only)	CNTRL-B ESC V CNTRL-B A	CNTRL-B ESC V CNTRL-B SPACEBAR

A summary of the Gemini's commands.

quences this won't show on your printed copy.

One of the limitations of the Gemini which you'll come across very early on is the paper out detector. It's supposed to stop your computer from having the printer clatter away on an empty platten after the end of a sheet but, in fact, if you are using the thing with single sheets it will keep you from printing on the last third of the page or so.

Once again, there are barbaric solutions to this hassle, such as propping a second sheet behind the first. You'll need further clever tricks to handle envelopes. However, once again there is a software approach to this which is much simpler. With a few simple characters you can put the paper out detector, and its attendant brain damaging alarm, to sleep.

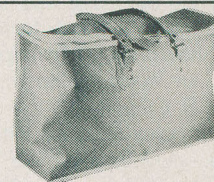
Control B escape 8 disables the paper out detector. Put it right after the initialization sequence and you can type anywhere on anything.

One of the things that does work properly when speaking Epson-ese to your Gemini is accessing the darker print modes. If you already know about control B you probably know this. Control B escape E puts you in emphasized mode and control B escape F turns it off. Control B escape G turns on the double strike mode control B escape H turns that off.

There is a difference between these... even if they do both produce darker letters. Double strike means the print head comes back and prints over the letters a second time so you get twice as much ink on the paper. The emphasized mode uses a higher

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# Opening The Magic Window

resolution print, hence producing more dots per letter. Thus emphasized produces a more pleasing, letter quality type character... double strike still leaves you with dotted looking, computer like print. You can combine the two, however, for a very letter quality appearance. Be forewarned, though; using the combination after you put in a brand new ribbon is liable to give you hairy looking letters.

## The Wind Up and the Pitch

The normal mode typeface you get when you first turn on your printer is called *pica* in regular typewriter parlance. This means that it produces ten characters to the inch. You can also print in the other standard typewriter pitch, *elite*, with your Gemini. Control B escape B control B B causes your printer to type twelve characters to the inch. Control B escape B control B A puts you back in the normal ten pitch mode.

Not only does elite allow you to squeeze more words on a line but it also has a quainter, somewhat more typewriter-like appearance. Unfortunately, you can't use the emphasized mode with elite. The dots are already squeezed together. You can still use double strike mode to add emphasis.

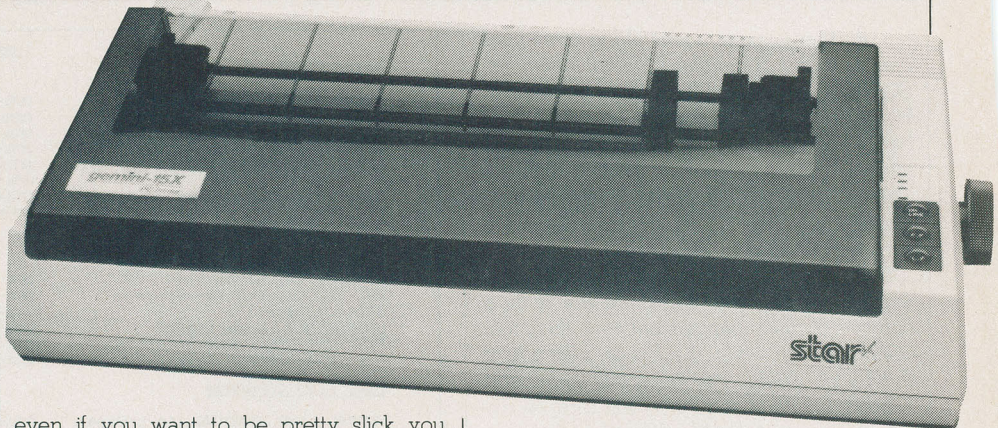
For doing titles or really making something stand out you can get the printer to do double width. In fact, there are three sizes of double width characters available by applying this sequence to the three pitch modes of the printer. Pica is converted to five pitch, elite to six pitch and condensed to eight and a half pitch.

The sequence to go from whatever mode you are currently in to the double width version of that mode is control B escape W control B A. To return to the single width type do control B escape W control B space bar. That was the toughest control character sequence to figure out... who's ever heard of control spacebar? It shows up as an inverse @ on your monitor.

Control B O turns on the condensed mode, which gives you two letters for the price of one... actually seventeen characters per inch. Control B R will turn it off. Like elite, condensed mode can't be used with emphasized print.

If you want to get into some heavy weirdness, you can combine double width and condensed type to get... uh huh, double width condensed. This may seem a bit pointless as it produces an emphasized, normal typeface. The difference seems to be that the spacing between the letters is slightly wider.

The italic mode is switched on with control B escape 4 and switched off with control B escape 5. Italics look very pleasing but



even if you want to be pretty slick you should use them sparingly. A letter written with an IBM Selectric typewriter all in italics looks very nouveau something. However, done in dot matrix they are very hard on the orbs.

Underscore is one of the modes which you can turn on with the Epson codes but not off. The Gemini sequences work rather better. Turn it on with control B escape hyphen control B A. Turn it off with control B escape hyphen control B spacebar.

Of aesthetic appeal predominately to users with scientific applications subscript and superscript on the Gemini are not exactly the way they should be. Subscripts should be printed slightly below the line and superscripts slightly above. Instead what they are are half height letters. The effect is still infinitely better than what you'd get on a typewriter, though.

The control sequences given here are quite dissimilar from those used with the Epson. Turn superscript on with control B escape S control B A and turn it off with control B escape T. Turn subscript on with control B escape S control B spacebar. Strangely, it turns off with the same control B escape T as superscript.

The subscript and superscript modes have some quirks. The least desirable that in lower case any letters with descenders are printed one dot lower than regular letters. The only way around this one is to avoid using lower case when using these modes... actually, not that hard to do.

Like the elite and condensed modes, subscript and superscript can not be used with emphasized type. However, it is interesting to note that they are, in fact, always double struck. You can use them in italics and in any of the three pitches but, for reasons the manual doesn't explain, not in double width mode.

## Getting Fancy

Coercing block graphics and special symbols from the Gemini is among the trickiest

of procedures. Getting at every available character in the machine is not that easy and different computers have their own peculiarities. Older model Apples, for instance can't access the reverse backslash now usually found as a shifted L, the underline character, shifted O, or the right square bracket, shifted K. Newer models can't get at the left or right parenthesis, the vertical rule or the left single quote character.

If you have a Franklin computer or one of the new fancy keyboards such as the Keytronics you've got no problems. Owners of more primitive hardware will have to put in a little more effort. If you don't have lower case built in then you must use an escape key to toggle between upper and lower case with Magic Window. To get the special characters refer to figure two.

With the escape toggled off you can get the oddball characters simply by shifting the K, L, M, N, O, and P keys. You may have to do control Y to get to the editor functions and turn off the convert caret to underscore function in order to access the caret and the tilde characters.

In order to turn on the block character, special character and accent mode of the Gemini you must enter control B escape greater than... a shifted period... and there you are with ninety-six more characters available to your printer. Turn it off with control B escape equals sign.

The block graphics are all the lower case letters from a to z plus the four special characters generated by control B O, 1, asterisk and 4 that are listed in figure two. You could also consider the rounded corners generated by control B spacebar exclamation point, quote and hash mark to be part of the block graphics set.

To do more than one line of block graphics you will have to reset your line spacing or you'll end up with unwanted spaces from one line to the next. Enter control B 3 control B L to set the proper spacing



Block graphics are not that hard to use. You can make them a lot easier if you construct a block graphics grid. It can be any size you want. You may desire to make up a grid a full page in size and then modify it after you have completed your graphic or you may only want to make up a small grid when you know you only want a small design.

Constructing a grid looks tedious but is really quite simple. Make sure you have an initialization line before the grid containing the degree of emphasis, the line spacing, and the unidirectional printing code control B escape control B A... this latter part is very important or you will end up with each line being slightly misaligned. Begin the first line of the grid with control B escape V to turn on block graphics and be sure to end the line with control B escape equals sign to turn block graphics off... If you don't do this for every line you will end up with a series of block graphic characters being printed in the margins since in block graphic mode the spacebar causes a small curve to be displayed.

Between the graphics turn on and turn off on each line of the grid we print a left single quote by typing control B 7. Now all you have to do is duplicate those grid rows down the page. Control V will duplicate any character immediately above it so use control V and the repeat key to duplicate those tediously input grid lines for as far down the page as you want.

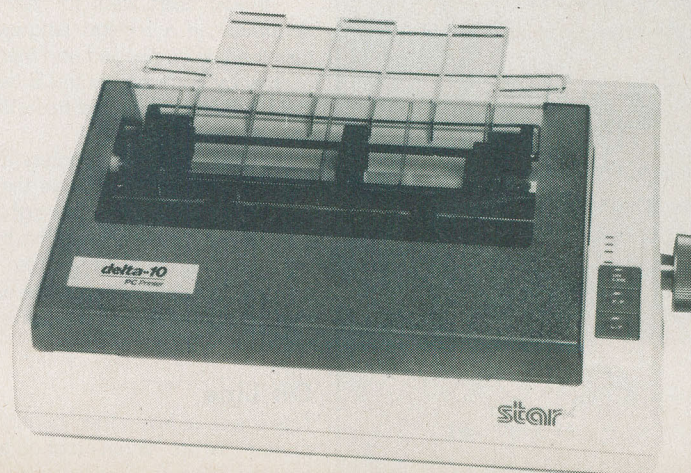
*Leading* is a term borrowed from typesetting and refers to the amount of space between the lines of type. You can adjust it to tighten or loosen up the lines. Set the leading with control B escape 3 control B U and you can fit seventy-five lines on a sixty-six line page. Use control B escape 3 control B S and you can cram eighty-three lines on it with a tiny bit of space between lines.

You can get practically any line spacing you want by substituting other characters for the last character in the sequence, but you'd better experiment with the results first to see if you get what you expected. Some characters will produce unusual effects because they are control codes representing other commands to the computer.

The foreign characters buried in the Gemini can be accessed in three ways. The French set can be turned on with the sequence control B escape 7 control B D.

[illegible]

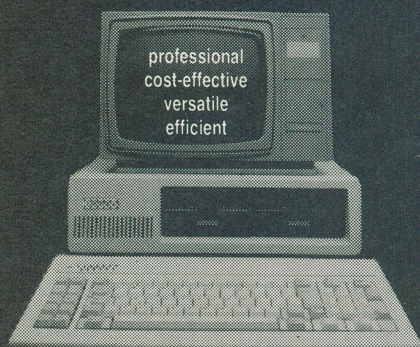
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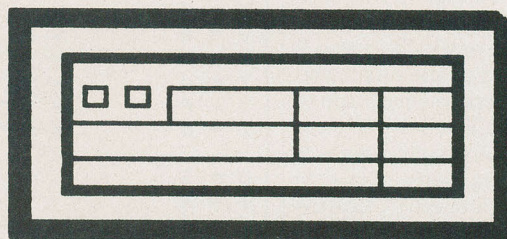
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## Opening The Magic Window

```

[0][E][G][U][A][3][L
[>'.....'[-
[>'oooooooooooooooooooooooo~'[-
[>'o.....o'[-
[>'o'dhhhhhhhhhhhhhhhhhhhb'o'[-
[>'o'j.....i'o'[-
[>'o'jprprpqqqqqqqqqqqq1'o'[-
[>'o'jvwvwu.....u'u'i'o'[-
[>'o'jqqqqxxqqqqqzqqqzqqq1'o'[-
[>'o'j.....u'u'i'o'[-
[>'o'jqqqqqqqqqqqxxqqqzqqq1'o'[-
[>'o'j.....u'u'i'o'[-
[>'o'cgggggggggggggggggggga'o'[-
[>'o.....o'[-
[>'oooooooooooooooooooooooo'[-
[>'.....'[-

```



Some of the more sophisticated graphics manageable by Magic Window.

TURN-ON CODE SEQUENCE	COUNTRY	CHARACTER
CNTRL-B ESC 7 CNTRL-B 8D	U.S.A.	# @ [ \ ] ^ ' ( ) ~
CNTRL-B ESC 7 CNTRL-B A	England	£ @ [ \ ] ^ ' ( ) ~
CNTRL-B ESC 7 CNTRL-B B	Germany	# \$ % & ' ^ ' ( ) ~
CNTRL-B ESC 7 CNTRL-B C	Denmark	# @ [ \ ] ^ ' ( ) ~
CNTRL-B ESC 7 CNTRL-B D	France	£ @ [ \ ] ^ ' ( ) ~
CNTRL-B ESC 7 CNTRL-B E	Sweden	# @ [ \ ] ^ ' ( ) ~
CNTRL-B ESC 7 CNTRL-B F	Italy	# @ [ \ ] ^ ' ( ) ~
CNTRL-B ESC 7 CNTRL-B G	Spain	# @ [ \ ] ^ ' ( ) ~

Refer to figure four to see how the other character sets can be accessed.

If you don't want to type your entire document in a foreign language you can turn it on when needed and then go back to normal by entering control B escape 7 control B which actually just turns the American character set back on.

Some foreign characters simply aren't available or you may have the proper accent but it's not over the right letter. You may be able to get around this by backspacing... you can do it just as if the Gemini were a typewriter and overprint the accent onto a regular character. All it takes is a little control B.H.

### Off Line

There are a few other capabilities of the printer that we haven't looked at here... but

most of them are not really applicable to word processing. You can, for example, put the Gemini into its bit mapped graphics mode from Magic Window... trickier still, however, is figuring out a use for this capability.

The Gemini printers are a really good value... once you know how to get the most out of them from your word processor. The complex escape sequences we've been looking at here may seem to be a hassle to learn... the applicable ones come quickly, though, and will become second nature with use.

They sure do make your screen look weird, though.

CNI



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**4**

**BP-109: THE ART OF PROGRAMMING THE 1K ZX81  
M. JAMES and S.M. GEE** **\$7.60**

This book shows you how to use the features of the ZX81 in programs that fit into the 1K machine and are still fun to use. Chapter Two explains the random number generator and uses it to simulate coin tossing and dice throwing and to play pontoon. Chapter Three shows the patterns you can display using the ZX81's graphics. It's animated graphics capabilities, explored in Chapter Four, have lots of potential for use in games of skill, such as Lunar Lander and Cannonball which are given as complete programs. Chapter Five explains PEEK and POKE and uses them to display large characters. The ZX81's timer is explained in Chapter Six and used for a digital clock, a chess clock and a reaction time game. Chapter Seven is about handling character strings and includes three more ready-to-run program — Hangman, Coded Messages and a number guessing game. In Chapter Eight there are extra programming hints to help you get even more out of your 1K ZX81.

**5**

**SB21862-APPLE® INTERFACING** **\$16.95**  
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**7**

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**8**

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This book is based on the author's own experience in learning BASIC and in helping others, mostly beginners, to program and understand the language. Also included are a program library containing various programs. Also included are a program library containing various programs, that the author has actually written and run. These are for biorhythms, plotting a graph of Y against X, standard deviation, regression, generating a musical note sequence and a card game. The book is complemented by a number of appendices which include test questions and answers on each chapter and a glossary.

**9**

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**10**

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Aimed at the absolute beginner with no knowledge of computing, this entirely non-technical discussion of computer bits and pieces and programming is written mainly for those who do not possess a microcomputer but either intend to one day own one or simply wish to know something about them.

### A CONSUMER'S GUIDE TO PERSONAL COMPUTING AND MICROCOMPUTERS, SECOND EDITION FREIBERGER AND CHEW \$15.95

The first edition was chosen by Library Journal as one of the 100 outstanding sci-tech books of 1978. Now, there's an updated second edition!

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A must for anyone just starting out in the field of computing, be they a businessman, hobbyist or budding computerist. The book presents and defines over 15,000 computer terms and acronyms and makes for great browsing.

### BEGINNER'S GUIDE TO COMPUTER PROGRAMMING TAB No. 574 \$15.95

Computer programming is an increasingly attractive field to the individual, however many people seem to overlook it as a career. The material in this book has been developed in a logical sequence, from the basic steps to machine language.

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## MICRO-PROCESSORS

### A BEGINNER'S GUIDE TO COMPUTERS AND MICROPROCESSORS — WITH PROJECTS. TAB No. 1015 \$13.95

Here's a plain English introduction to the world of microcomputers — its capabilities, parts and functions — and how you can use one. Numerous projects demonstrate operating principles and lead to the construction of an actual working computer capable of performing many useful functions.

### BP66: BEGINNERS GUIDE TO MICROPROCESSORS AND COMPUTING E.F. SCOTT, M.Sc., C.Eng. \$7.50

As indicated by the title, this book is intended as an introduction to the basic theory and concepts of binary arithmetic, microprocessor operation and machine language programming.

There are occasions in the text where some background information might be helpful and a Glossary is included at the end of the book.

### BP72: A MICROPROCESSOR PRIMER E.A. PARR, B.Sc., C.Eng., M.I.E.E. \$7.70

A newcomer to electronics tends to be overwhelmed when first confronted with articles or books on microprocessors. In an attempt to give a painless approach to computing, this small book will start by designing a simple computer and because of its simplicity and logical structure, the language is hopefully easy to learn and understand. In this way, such ideas as Relative Addressing, Index Registers etc. will be developed and it is hoped that these will be seen as logical progressions rather than arbitrary things to be accepted but not understood.

### HANDBOOK OF MICROPROCESSOR APPLICATIONS TAB No. 1203 \$15.95

Highly recommended reading for those who are interested in microprocessors as a means of accomplishing a specific task. The author discusses two individual microprocessors, the 1802 and the 6800, and how they can be put to use in real world applications.

### BP102: THE 6809 COMPANION M. JAMES \$7.60

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A "learn by doing" guide to the use of integrated circuits provides a foundation for the underlying hardware actions of programming statements. Emphasis is placed on how digital circuitry compares with analog circuitry. Begins with the simplest gates and timers, then introduces the fundamental parts of ICs, detailing the benefits and pitfalls of major IC families, and continues with coverage of the ultimate in integrated complexity — the microprocessor.

### DIGITAL INTERFACING WITH AN ANALOG WORLD TAB No. 1070 \$15.95

You've bought a computer, but now you can't make it do anything useful. This book will tell you how to convert real world quantities such as temperature, pressure, force and so on into binary representation.

### MICROPROCESSOR INTERFACING HANDBOOK: A/D & D/A TAB No. 1271 \$15.95

A useful handbook for computerists interested in using their machines in linear applications. Topics discussed include voltage references, op-amps for data conversion, analogue switching and multiplexing and more.

## BASIC

### BASIC COMPUTER PROGRAMS IN SCIENCE AND ENGINEERING GILDER \$19.95

Save time and money with this collection of 114 ready-to-run BASIC programs for the hobbyist and engineer. There are programs to do such statistical operations as means, standard deviation averages, curve-fitting, and interpolation. There are programs that design antennas, filters, attenuators, matching networks, plotting, and histogram programs.

### SB22047: 26 BASIC PROGRAMS FOR YOUR MICRO \$16.95

Features 26 previously unpublished, simple-to-complex games you can run on almost any brand of microcomputer as long as you have enough RAM on board. Most take between 500 and 5000 bytes, with the highest taking 13K. Conversion charts that let you key them into your Radio Shack, TRS-80, Apple II, Timex/Sinclair 1000 (ZX81), Spectrum, Atari, or PET are included. Also features notes on program techniques and structures.

### TAB1533: GRAPHICS PROGRAM IN MICROSOFT BASIC \$19.25

Generate computer art including mathematically defined art and animated graphics; draw still pictures — realistic and abstract; create an interactive space shuttle simulation; plot architectural and landscape drawings with both high and low resolution graphics; construct a 3-dimensional model of a function; plot 2-dimensional graphics, statistical relations, maps and diagrams. All these are written in Microsoft BASIC that is adaptable to just about any BASIC micro system.

### THE MOST POPULAR SUBROUTINES IN BASIC TAB No. 1050 \$10.95

An understandable guide to BASIC subroutines which enables the reader to avoid tedium, economize on computer time and makes programs run faster. It is a practical rather than a theoretical manual.

### COMPUTER PROGRAMS IN BASIC AB001 \$14.95

A catalogue of over 1,600 fully indexed BASIC computer programs with applications in Business, Math, Games and more. This book lists available software, what it does, where to get it, and how to adapt it to your machine.

### THE BASIC COOKBOOK. TAB No. 1055 \$9.95

BASIC is a surprisingly powerful language — if you understand it completely. This book, picks up where most manufacturers' documentation gives up. With it, any computer owner can develop programs to make the most out of his or her machine.

### BASIC FROM THE GROUND UP SIMON \$19.95

Here's a BASIC text for high school students and hobbyists that explores computers and the BASIC language in a simple direct way, without relying on a heavy mathematical background on the reader's part. All the features of BASIC are included as well as some of the inside workings of a computer. The book covers one version of each of the BASIC statements and points out some of the variations, leaving readers well prepared to write programs in any version they encounter. A selection of exercises and six worked out problems round out the reader's experience. A glossary and a summary of BASIC statements are included at the end of the book for quick reference.

## MISCELLANEOUS

### Z-80 AND 8080 ASSEMBLY LANGUAGE PROGRAMMING SPRACKLEN \$18.95

Provides just about everything the applications programmer needs to know for Z-80 and 8080 processors. Programming techniques are presented along with the instructions. Exercises and answers included with each chapter.

### Tab 1389: MACHINE AND ASSEMBLY LANGUAGE PROGRAMMING \$14.95

This book assumes no prior programming knowledge and starts by explaining the advantages of ML. Several sample programs are included and each chapter ends with a quiz to check your understanding of that section.

### SARGON: A COMPUTER CHESS PROGRAM SPRACKLEN HB12 \$27.50

"I must rate this chess program an excellent buy for anyone who loves the game." Kilobaud.

Here is the computer chess program that won first place in the first chess tournament at the 1978 West Coast Computer Faire. It is written in Z-80 assembly language, using the TDL macro assembler. It comes complete with block diagram and sample printouts.

### PH180: 1983 CANADIAN BUSINESS GUIDE TO MICRO- COMPUTERS \$11.95

Written by the managing director of Deloitte, Haskins & Sells, a Canadian partnership of public accountants and other professional advisors to management, this book is one of the most complete comprehensive guides to microcomputers available. Starting with a general overview of microcomputers and their business applications, the author helps you assess your computer needs, compares and evaluates computer systems and application packages, and gives you tips on "doing it right". A must for anyone thinking of purchasing a microcomputer for business.

### HOW TO PROFIT FROM YOUR PERSONAL COMPUTER: PROFESSIONAL, BUSINESS, AND HOME APPLICATIONS LEWIS \$18.95

Describes the uses of personal computers in common business applications, such as accounting, managing, inventory, sorting mailing lists, and many others. The discussion includes terms, notations, and techniques commonly used by programmers. A full glossary of terms.

### PH181: THE DATA BASE GUIDE C.BENTON \$26.00

Complete step-by-step book detailing the necessary elements for selecting, organizing and implementing database systems for microcomputers. Presents material at a beginner's level yet thorough enough to aid the professional data processing person.

## BUSINESS

### PH203: THE POWER OF MULTIPLAN™ MANAGEMENT INFORMATION SOURCE \$19.95

Covers Accounts receivable, invoicing, cost recovery production scheduling estimating, checkbook, and engineering problem solving accounts payable, payroll, monthly sales report, inventory and financial forecast.

### PH206: dBASE II USER'S GUIDE A. GREEN \$38.00

This instructional handbook for novices and experienced users alike presents a simple, highly effective approach to learning how to use this powerful software program available for microcomputers.

### BASIC COMPUTER PROGRAMS FOR BUSINESS: STERNBERG (Vol. 1) \$21.50

A must for small businesses utilizing micros as well as for entrepreneurs, volume provides a wealth of practical business applications. Each program is documented with a description of its functions and operation, a listing in BASIC, a symbol table, sample data, and one or more samples.

## GENERAL

### S-100 BUS HANDBOOK HB19: BURSLEY \$25.50

Here is a comprehensive book that exclusively discusses S-100 bus computer systems and how they are organized. The book covers computer fundamentals, basic electronics, and the parts of the computer. Individual chapters discuss the CPU, memory, input/output, bulk-memory devices, and specialized peripheral controllers. It explains all the operating details of commonly available S-100 systems. Schematic drawings.



# Computing Now! Bookshelf

## HB116: THE BASIC CONVERSIONS HANDBOOK FOR APPLE II<sup>TM</sup>, TRS-80<sup>TM</sup>, and PET<sup>TM</sup> USERS

**BRAIN BANK** \$14.50  
A complete guide to converting Apple II and PET programs to TRS-80, TRS-80 and PET programs to Apple II, and TRS-80 and Apple II programs to PET. Equivalent commands are listed for TRS-80 BASIC (Model I, Level II), Applesoft BASIC, and PET BASIC, as well as variations for TRS-80 Model III and Apple Integer BASIC. Also describes variations in graphics capabilities.

## TROUBLESHOOTING MICROPROCESSORS AND DIGITAL LOGIC

**TAB No.1183** \$15.95  
The influence of digital techniques on commercial and home equipment is enormous and increasing yearly. This book discusses digital theory and looks at how to service Video Cassette Recorders, microprocessors and more.

## MICROCOMPUTERS AND THE 3 R'S

**DOERR** \$15.95  
This book educates educators on the various ways computers, especially microcomputers, can be used in the classroom. It describes microcomputers, how to organize a computer-based program, the five instructional application types (with examples from subjects such as the hard sciences, life sciences, English, history, and government), and resources listings of today's products. The book includes preprogrammed examples to start up a microcomputer program; while chapters on resources and products direct the reader to useful additional information. All programs are written in the BASIC language.

## CONSTRUCTIONAL

### TAB1449: COMPUTER PERIPHERALS YOU CAN BUILD

\$20.95  
Shows you how to build A/D and D/A converters, cassette interfaces, light pens, disk drives, AC and DC control mechanisms, music boards and much more.

### HOW TO BUILD YOUR OWN WORKING MICROCOMPUTER

**TAB No.1200** \$15.95  
An excellent reference or how-to manual on building your own microcomputer. All aspects of hardware and software are developed as well as many practical circuits.

### BP78: PRACTICAL COMPUTER EXPERIMENTS

**E.A. PARR, B.Sc., C.Eng., M.I.E.E.** \$6.80  
Curiously most published material on the microprocessor tends to be of two sorts, the first treats the microprocessor as a black box and deals at length with programming and using the "beast". The second type of book deals with the social impact. None of these books deal with the background to the chip, and this is a shame as the basic ideas are both interesting and simple.

This book aims to fill in the background to the microprocessor by constructing typical computer circuits in discrete logic and it is hoped that this will form a useful introduction to devices such as adders, memories, etc. as well as a general source book of logic circuits.

## KIDS

### PH115: KIDS AND THE APPLE

**E. CARLSON & DATAMOST** \$26.00  
Written primarily for 10 to 14 year-olds, this book helps kids (as well as parents and teachers) become pros at writing Applesoft Basic Programs for home computers. Through a series of 33 sequential, easy-to-follow lessons, examples and exercises, learn how to program Apple computers, to play board games, word games, action games, store and recall personal data, debug, edit, create graphics, even create a program.

### PH216: KIDS AND THE VIC

**E. CARLSON & DATAMOST** \$26.00  
Written primarily for 10 to 14 year-olds plus parents and teachers, this new guide offers sequential, easy-to-follow lessons, examples, and exercises that illustrate how to program the VIC personal computer to play board games, word games, and action games, store and recall personal data, debug, edit, create graphics, and more!

## SYSTEM SPECIFIC COMMODORE

### Secrets of the Commodore 64

**BP135** \$9.50  
Contains a load of information that assumes no knowledge other than the manual which comes with the computer and is designed to complement that manual. Covers sprites, PEEK and POKE, high resolution graphics, sound facilities, memory maps, machine code programming and much more.

## APPLE

### HB107: GRAPHICS COOKBOOK FOR THE APPLE

**WADSWORTH** \$15.95  
Learn how to use your Apple II to "paint" shapes, objects, and letters in low-resolution graphics. The author provides a library of microcomputer graphics including such multicolored illustrations as robots and flying saucers, trees, sailboats, and colourful picture backgrounds. Contains complete annotated Applesoft BASIC programs to draw all the pictures described in the book as well as suggestions for improving programming techniques.

### SB21889: INTERMEDIATE LEVEL APPLE II HANDBOOK

**D. HEISERMAN** \$23.95  
Hands-on aid for exploring the entire internal firmware of your Apple II and finding out what you can accomplish with its 6502 microprocessor through machine- and assembly-language programming. Good introduction if you're ready to move out of BASIC but don't want to buy more hardware.

### PH51: PASCAL FOR THE APPLE

**IAIN MacCALLUM** \$33.80  
A step-by-step introduction to Pascal for Apple II and Apple II Plus users. The package of text and software diskette provides readers with worthwhile and interesting programs which can be run immediately and the results studied. Includes over 200 exercises with full solutions. Book/Disk Package.

### PH52: APPLE GRAPHICS GAMES

**PAUL COLLETTA** \$40.95  
Contains 10 arcade-style games written especially for the Apple II, including Spider, Piano, Pairs and Poker, as well as education, math, and designing games. Book/Disk Package.

### SB21864: MOSTLY BASIC: APPLICATIONS FOR YOUR APPLE II, BOOK 2

\$18.50  
A second goldmine of fascinating BASIC programs, including two dungeons that test your math and history abilities and another one that's strictly for fun, eleven household programs, a monthly savings plan and six more on money or investment, two that test your level of ESP, and more — 32 in all! Excellent for beginning or advanced computerists.

### SB21894: APPLE II ASSEMBLY LANGUAGE

\$22.50  
Specifically directed to the beginning programmer who has no prior experience with assembly language. Shows you how to use the 3-character, 56-word assembly language vocabulary of Apple's 6502 microprocessor to create powerful programs that bring you inside the brain of the Apple itself! Can be read by Apple owners in all walks of life simply as a learning experience or used in a conscientiously applied assembly language study program.

### SB22026: POLISHING YOUR APPLE II

\$6.95  
Clearly written, highly practical, concise assembly of all procedures needed for writing, disk-filing, and printing programs with an Apple II. Positively ends your searches through endless manuals to find the routine you need! Should be in the hands of every new Apple user, regardless of experience level. Ideal for Apple classrooms too!

### PH106: PROGRAMMING TIPS AND TECHNIQUES FOR THE APPLE II

**J. CAMPBELL (1983)** \$22.95  
An advanced exploration of the intricacies of structures programming. Further develops the skills necessary to solve programming problems. Special chapter on sound and graphics which discusses both high and low resolution graphics for the Apple II.

### Introducing the Apple Macintosh

**SB22361** \$18.50  
Included are How a desktop computer can be more efficient, How MacThinking improves productivity, What is behind the magic of MacWindows, How to get the most from the Mouse, Using MacPaint, MacWrite plus the other MacTools, what software is available, how the 68000 processor works etc.

### PH104: ACCOUNTANT'S BASIC PROGRAMMING FOR THE APPLE II

**A. PARKER & J. STEWART (1983)** \$19.95  
Shows the reader how to program the Apple II to perform a variety of accounting functions, such as payroll, accounts payable, accounts receivable, tax, inventory, customer statements, and more.

### PH107: APPLE LOGO PRIMER

**G. BITTER & N. WATSON (1983)** \$19.95  
A pictorial starter book that will make LOGO easy for anyone. Includes easy to follow examples and reference tables. Also included is a workshop outline for teachers and leaders who want to train others.

### PH112: APPLE FILES

**D. MILLER (1982)** \$19.95  
Aimed at the Apple user who is familiar with BASIC and wants to set up or expand files for home or business. Includes programs for mailing lists, a medical records system, home inventory and more.

### PH113: THE VISICALC BOOK: APPLE EDITION

**D. BELL (1982)** \$19.95  
A helpful and informative guide to using VISICALC, the "electronic spreadsheet" software program that's perfect for pricing/costing estimates; profit/loss forecasting and hundreds of other business "what if" questions. Specifically written for Apple computer systems.

### PH118: INTERFACE PROJECTS FOR THE APPLE II

**R. HALLIGREN** \$16.95  
Provides Apple II users with a series of interface projects that are easily built and enable the user to discover the computer's capabilities through project construction.

## IBM P.C.

### PH157: INTRODUCTION TO CICS PROGRAMMING

**L. MILLER & L. VIANDS** \$33.00  
Presents a step-by-step, easy-to-follow introduction to the practical use of CICS — an IBM software product for data communications and the development of on-line computer applications. All examples shown are independent of the operating system, but they assume a basic knowledge of COBOL.

## TRS-80

### SB21893: TRS-80 COLOUR COMPUTER

**INTERFACING** \$20.95  
Teaches you the interfacing techniques, inner workings, and operation of the TRS-80 Colour Computer as well as its high-performance 6809 microprocessor. Find out how to control and monitor various equipment and events by means of the Computer's expansion connectors. Excellent info for budding electronic and computer engineers and technicians at all levels.

### PH121: HARDWARE INTERFACING WITH THE TRS-80

**J. UFFENBECK (1983)** \$18.95  
TRS-80 Model I and Model III owners now have a book to help them understand how to use their personal computers to monitor and control electronics interfaces between the computer and the home or industrial environment. Contains 14 hands-on experiments using BASIC.

## TIMEX/SINCLAIR

### BP114: THE ART OF PROGRAMMING THE 16K ZX81

**M. JAMES & S.M. GEE** \$9.90  
The book starts by introducing the 16K RAM pack and the printer. It continues by explaining how the extra storage is used and presents a memory test program to check that the 16K RAM pack is operational. Chapter Three covers some utilities that you will find useful in writing longer programs. Chapter Four is an interlude from serious applications, presenting four games programs that make the most of the extended graphics capabilities now available to you. Chapters Five to Eight deal with writing and debugging large programs, storing them on cassettes and printing out both programs themselves and their results. These chapters also introduce programs for editing data bases and statistical analysis for financial management and covers text and graphics printing. Chapter Nine takes a look at randomness. Chapter Ten introduces machine code and explains why you might like to use it.

## PET/CBM/VIC

### PH57: START WITH BASIC FOR THE COMMODORE VIC 20

**D. MONRO** \$32.95  
This book/cassette package shows the reader how easy it really is to create programs using the full capacity of the machine. Includes helpful exercises and step-by-step instructions to put the full power of the VIC 20 at the user's fingertips. Book/Cassette Package.

### SB22056: COMMODORE 64 PROGRAMMER'S REFERENCE GUIDE

\$27.95  
A creative programmer's working tool and reference source, packed with professional tips and special information for getting the most out of your Commodore 64! Includes a complete, details dictionary of all Commodore BASIC commands, statements, and functions, followed by BASIC program samples showing how each item works. Also tells you how to mix machine language with BASIC, use hi-res effectively, and much more! By Commodore Computer, 486 pages.

See Order Form on page 79



# Business On Line



**If you need access to information you may be quickly coming to the conclusion that the traditional sources of data... newspapers, annual reports and Knowlton Nash... are just not sophisticated enough for your needs. You may be about ready to start looking at on-line professional data bases. Here's a peer at two of the most interesting ones.**

**by Frank Lenk**

**A** lot of the more speculative works of techno-fiction which inhabit the media as prognostication have a lot of our future time spent wrapped up in various forms of telecommunications. They go on about the "electronic cottage" and other concepts. Given a few years it looks as if it should be possible to access the sum of man's knowledge through a micro at three hundred baud.

In fact, a lot of this speculation is at least partially grounded in fact. There is an awful

lot of data on line, with more being added, it seems, by the millisecond. Furthermore, it's all yours for the price of a modem... and the connect fees... and the Datapac charges...

There have been a number of features in Computing Now! looking at the large on-line data bases... for example, CompuServe was featured in the October 1983 edition with the Source a month later. However, these are very general public data exchanges. There is life beyond CompuServe... in the form of more specialized...

and, albeit, much more expensive... business oriented systems.

## **As The Globe Turns**

As an introduction to the more sophisticated on-lines let's consider the prospects of the news of the day. There are a number of areas which require extensive background research. It becomes important to know what led up to the present calamity, what sort of history the site of your next venture has, and so forth. One can create a



background data base of one's own. However, this shortly becomes a task all by itself and the three hundred megatons of paper and other desk flotsam that represents an average research file may threaten to engulf you.

One of the best sources of research material is in the archives of the Globe and Mail newspaper. Quite a number of researchers draw on the paper version of this every week. However, if you can pop for the on-line fees you can get it by the byte... the Globe and Mail operates a database called *InfoGlobe*.

The Globe, as denizens of many of Canada's business centres will know, aims to be the definitive organ for the serious reader. The comics aren't, really, but all that small print on the other pages usually manages to keep track of the pressing issues of the day. In fact, it's not fanciful to say that that many businesses virtually set their clocks by the pronouncements of this newspaper.

As long as the present is all you're worried about the paper version of the Globe and Mail is fine. However, when the past is the issue, InfoGlobe starts to look like a powerful tool. In addition to its historical perspective, a separate aspect of it, MarketScan, lists daily pricing and volume for stocks on four Canadian stock exchanges as well as for the New York exchange. However, let us confine ourselves less mercenary matters.

Like its low tech ancestor, InfoGlobe takes itself quite seriously. Your first clue to this is the magnitude of the users' manual which accompanies the sign-up rituals, a well stuffed three ring binder. This beast assumes that you know nothing about anything and least of all about computers. Thus a lot of pages are devoted to the mysteries of upper and lower case, backspacing, and similar esoterica. Some more pages delve into the mysteries of modems, baud rates and what those little buttons on your phone are for.

Finally you come to dialing in. Access is through one of three data communications networks; Datapac, Telenet or Tymnet. These systems bundle many on-line services together, delivering them to the users. Major centers offer both three hundred and twelve hundred baud transmission.

In Canada, most everything goes through Datapac. Subscribers dial up their local network ports, sign on with a password and then call up the desired service... in this case, InfoGlobe... by means of an address code. A second password is required to log onto the database itself.

Once you get past all that, you are

ready for basic techniques. You will find that although InfoGlobe has a powerful command structure, it is not really all that complicated. The real beauty of the manual is that it spends most of its time trying to show you how to squeeze the most out of the available commands and therefore, out of your connect dollars.

### Digging Up The Past

The most powerful research tool of InfoGlobe is its ability to search its archives. The *S* command will allow you to enter a keyword string... a word or a phrase of interest... and thereafter go cruising through the megabytes until the computer finds an item containing that string.

The system is quite sophisticated. For example, it has a list of forty-nine *stopped* words... ones that are too common to merit searching for.

If all were to be well, however, you'd get a message like "ARTICLE 1 OF 30 PAGE 1 OF 3". The first article will immediately commence to unreel upon your screen. The pages are screen pages, twenty-three lines each. Articles come up in reverse chronological order to keep you from having to plough through the aged bit to get at the most recent data. The words you've searched for are highlighted with asterisks.

Scrolling text may be broken out of at any point. The system pages, stopping after each twenty-three lines and prompting the user for a carriage return. As such, you needn't fear slipping off to answer the phone and finding the bit you were interested in three lines beyond the top of your tube.

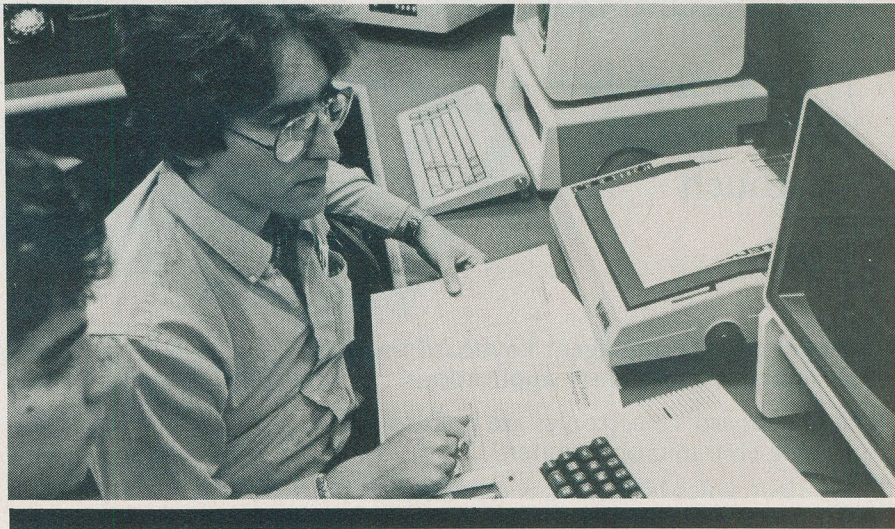
There are some powerful options built

into the search function itself. Logical operators are supported. Thus you can search for "telidon and micro or personal and computers". The *or's* have precedence. The "s" allows search for both singular and plural forms. Various suffixes may be used this way: "es", "e", "ing" and so on. In addition, an asterisk, "\*", may be used as a wildcard". The *andp* option specifies that both search strings must occur within the same paragraph in the required articles. *Not* allows the user to exclude all articles containing a particular word or phrase. This feature can be used to expand on a previous search while avoiding duplications.

Considerable finesse can go into setting up a search statement. The manual deals at length with how the statements execute. For instance, fine distinctions can be made between use of a two word phrase or the two single words combined by *and*.

As is often the case with large business databases, InfoGlobe offers an off-line printing option. You can specify that the results of your searching be printed out as hard copy and delivered to you. It does seem a bit... well, nineteenth century... to send all this technological splendour through the post office.

The idea of *segmentation* is another useful search concept. The articles held by the database are stored in specific fields, to wit, by date, page and illustration, by the writer's byline, by classification and source, by dateline and words, by headline, by text, memos and notes and, finally, by added search terms. By using the "@" operator with either field names or numbers one can limit a search to one or more of the fields.





## Business On Line

Thus, headlines can be searched alone. Perhaps you're interested in getting at all the pieces by a particular writer.

The time range for a search can be limited using the *setr* command, the default at sign on being the previous two years. The database actually reaches back to the dim days of 1977.

Search specification statements can be saved within the system and called up later. Menu driven operation can be requested for any account, using pre-defined searches. Thus the whole thing can be set up once by an expert and thereafter accessed by inexperienced users.

### Other Worlds

InfoGlobe is unquestionably a massive resource. There are, however, other on-lines which are equally as useful to given areas of inquiry.

One example of a more specialized database is the BRS, which presumably stands for *Bibliographic Retrieval Service*. This New York based system... available locally through Datapac... differs from InfoGlobe by virtue of its diversity. InfoGlobe lets you leaf through back issues of one newspaper but BRS ties you into over seventy-five individual databases ranging in content from the sublime to the incomprehensible.

The BRS directory and catalog breaks things down by category... you can dig through sciences and medicine, business and financial, reference, education and



social sciences and humanities.

*Reference* is the smallest class, containing a mere nine databases so far. These span from the general *Academic American Encyclopedia* to the more intimidating *Dissertation Abstracts*. Also included are items like "Books in Print", familiar to bookstore browsers as the ultimate source of information on what's to be found between covers 'round the world.

Perhaps you fancy something in a business and financial vein. There's the *Harvard Business Review*, and the *Index to Frost & Sullivan Market Research Reports*. For light reading, you might want to peruse the *Predicasts* series, four separate databases covering forecasts, historical time, annual reports and such.

*Science and medicine* includes *Agricola*, on agriculture, chemical

abstracts, *excerpta medica*, the Kirk Othmer Encyclopedia of Chemical Technology... running to twenty-three volumes in hardcopy, some nine million words covering every known chemical compound... robotics information and numerous others.

*Social sciences and humanities* has some really good ones. Several highly regarded databases cover information for and about the disabled. These include ABLEDATA, National Information Sources on the Handicapped and the National Rehabilitation Information Centre. If delving into the nether regions of the mind is your thing, you can scan through PsycINFO. The twenty-first century theologian may appreciate the religion index. Of interest to many users, some of which will eventually get caught, there's *DrugInfo*, actually two

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databases, DRSC, educational and sociological aspects of drug use and HAZE, which is specifically on alcoholism.

As tools go, BRS is a bit simpler to use than InfoGlobe. You can select a database by entering its four letter code at the main prompt. For instance, AAED gets you the Academic American Encyclopedia.

Once in a particular database the primary prompt will ask you for a keyword to search for. Without getting into all the nuances of the searching syntax... it varies amongst systems but the search capabilities of the large on-lines are about the same... the databases allow you to scan through them in the same sort of fashion as with InfoGlobe.

A sieve oriented search seems to arise naturally on BRS. You try one word after another, then *and* them together to arrive at the information you really want... hopefully a manageable chunk of text. Once a word or statement is entered, it can be referenced by its line number for the duration of that particular search sequence.

The *..change/name* command switches the user over to the database specified by *name*. Thus, you can thread your way along a particular topic with a minimum of puzzling over roots and menu levels. There is also a *cross* facility which allows users to search all or selected groupings of BRS databases at one time. Each database is assigned a cross category and number according to its subject matter.

There are some attractive subscription options offered to BRS customers. For example, SDI, *selective dissemination of information*, is similar to InfoGlobe's search save feature. However, with SDI the stored search profile is automatically run whenever the particular database is updated. Results are sorted to each user's specifications, printed out and forwarded by first class mail.

Subscription rates for BRS are less simple than the straightforward hourly connect rates charged by InfoGlobe. Customers are offered a variety of access plans which provide volume discounts in exchange for commitment to a minimum number of annual on-line hours.

For the thrifty dilettante there's *BRS after dark*. This gives access to many BRS databases at a reduced connect cost between the hours of six pm and midnight.

## Bye

It's not really possible to do more than scratch the surface of any of these on-line services in just a session or two. If you are involved in the modern information economy, these services are going to be in-

creasingly indispensable. If you happen to be one of those people who can while away the hours by browsing through reference works, encyclopedias, and such, then they could easily prove to be an expensive addiction.

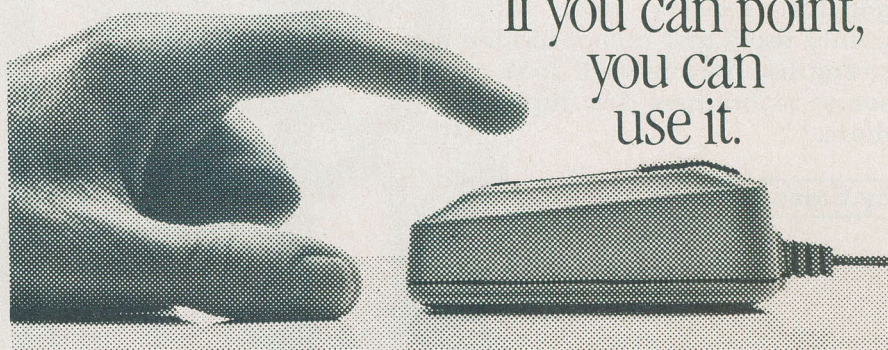
And there's always another one to be explored...

Information regarding InfoGlobe can be had by calling (416) 585-5250 or by writing the Globe and Mail at 444 Front Street West, Toronto, Ontario M5V 2S9. BRS may be called collect at (518) 783-7251 or written to at 1200 Route #7, Latham, New York 12110.

CNI

# Macintosh™

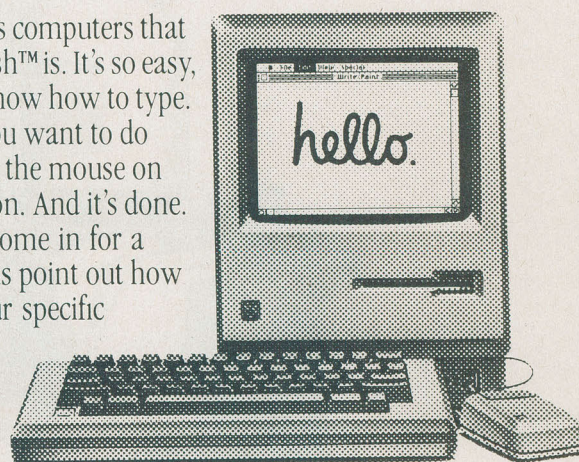
If you can point,  
you can  
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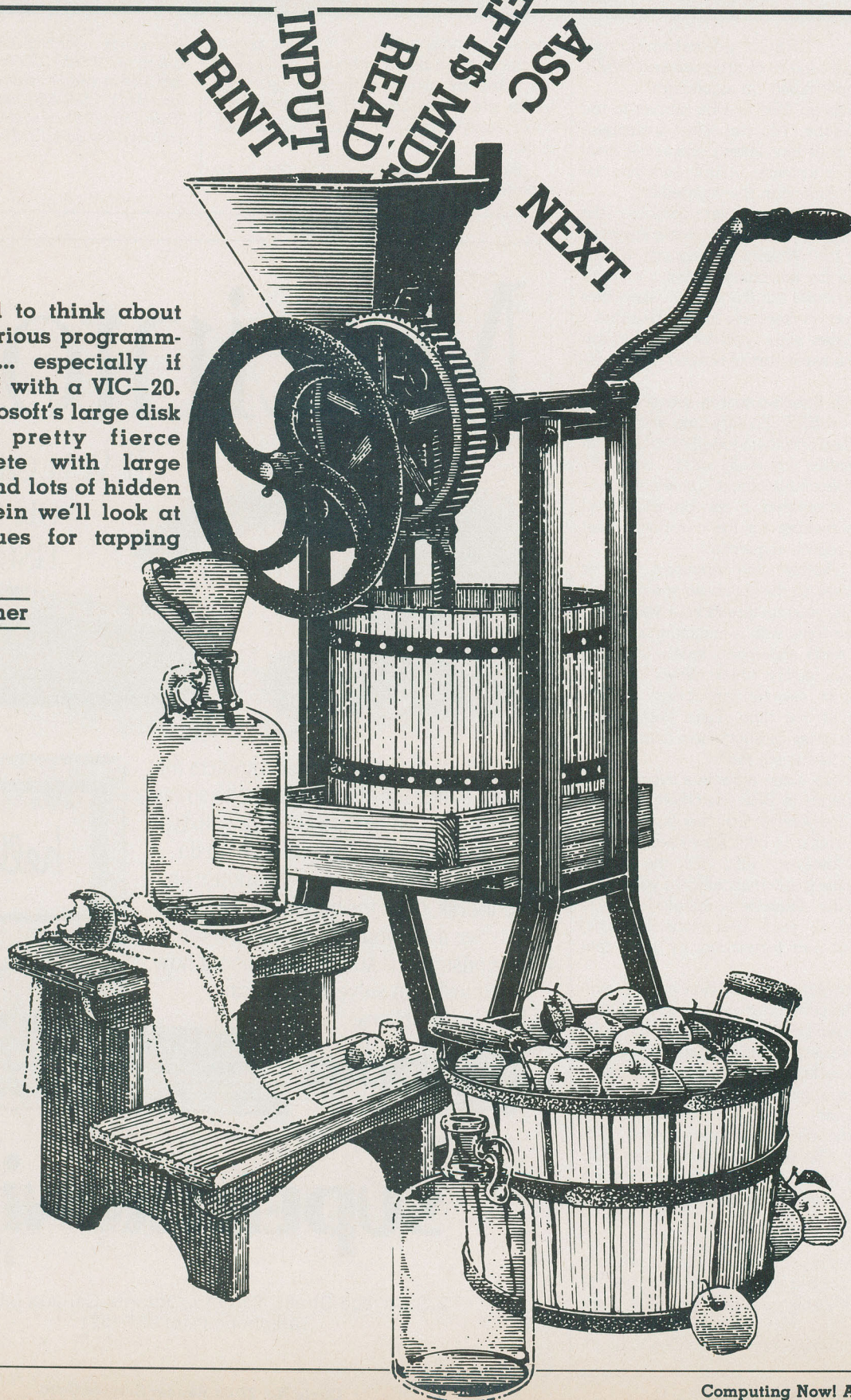
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# A Small Potful Of BASIC Routines

It's a bit hard to think about BASIC as a serious programming language... especially if you started off with a VIC-20. However, Microsoft's large disk BASICs are pretty fierce gorillas, replete with large pointy teeth and lots of hidden strengths. Herein we'll look at some techniques for tapping them.

by Steve Rimmer





**M**icrosoft BASIC is a splendid language for doing all sorts of things in... made splendor, or more splendid, depending on whether or not you have a spelling checker, by the availability of a BASIC compiler to soup it up. It can do things which were just impractical to consider in BASIC a few years ago. The capability of being able to develop code with the interpreter, rather than a compiler, can speed up the realization of a large package by an order of magnitude.

If you're just getting into BASIC programming you may still be having difficulty with exercising BASIC to its full potential. There are a lot of aspects of it which don't leap immediately to the fore... in fact, most of them are hidden deep within the dripping catacombs of the documentation. However, of greater pomp and import is the potential for doing clever things with BASIC just by using clever programming techniques.

This feature should be of assistance to anyone who's just getting into BASIC. Check out these examples and you'll be able to write tighter, faster code that's easier to debug. Since a great deal of programming involves much the same sort of input/output and data handling these routines may be directly applicable to you.

If you have a CP/M based computer running MBASIC or BASIC 80, all of the following routines should fly with no burps at all. Other systems will still be able to make use of them, but expect to have to perform a bit of cosmetic surgery to the works.

## Back to BASIC's

If I have to write a large program in a hurry I generally resort to a block of code which I keep in a file called STASH.BAS. It's a very slimy way to program, but it can literally reduce the time it takes to do a large application by ninety percent.

Large programs, unless you program using the random byte technique, are generally made up of fairly short main routines followed by lots and lots of subroutines. If you want to make things easier in terms of this feature you can take the PASCAL view of this, and look at a program as having all the subroutines first, the main routine last and, to make BASIC happy, a GOTO statement early on pointing down to the main bit. This has some advantages... the subroutine you are presently debugging can always be up at the top where it's easier to find.

My STASH.BAS file is a huge collection of useful subroutines, some of which are even now smiling from these pages. I consider it to be a bit slimy because in using it I just just inhale the thing into a program and

make calls into it... any routines that aren't used still get left in the code. However, its power compensates for this... twelve seconds after starting the program I have access to great seething hives of completely debugged, totally useful routines.

The first thing in STASH.BAS is a collection of *defines*. This is a concept left over from machine language programming wherein the assembler allows you to define the values of constant labels used throughout the program. You can't actually do this with BASIC, but you can assign named variables to hold useful stuff.

Suppose you wanted to print:

**Electric wombats  
rule the skies**

One would generally use two PRINT statements, one for each line. This is cheap and nasty, but hardly economical of space or particularly slick. Sometimes it isn't even practical when you get into sneakier programming problems. A better way is to say:

```
PRINT "Electric wombats" CHR$(13)
CHR$(10) "rule the skies"
```

This is better, but it's tedious typing out the CHR\$ values every time you want to use a control character. It's a lot easier to say:

```
PRINT "Electric wombats" CR$ LF$
"rule the skies"
```

having defined that CR\$ contains CHR\$(13) and so forth earlier on.

There are a number of characters like this which are just generally useful. I always define them first...

```
100 'DEFINES
105 BS$ = CHR$(8) : HM$ = CHR$(30)
110 CR$ = CHR$(13) : LF$ = CHR$(10)
115 ESC$ = CHR$(27) : CLS$ = CHR$(26)
120 UP$ = CHR$(10) : RT$ = CHR$(12)
125 RUB$ = BS$ + " " + BS$ : CAN$ =
CHR$(24)
130 BOX$ = CHR$(160)
200 UCASE$ = "ABCDEFGHJKLMNOP-
QRSTUVWXYZ"
205 LCASE$ = "abcdefghijklmnopqrstuvwxyz"
```

These are all fairly common ones, and most are universal. BS is backspace... as opposed to information from the government... HM is home, CAN is control X and so on. BOX is one character which, when printed, will display a square box on your screen... we'll get to an application for this later on. CLS is the string to clear your screen... it may very well *not* be the one I've shown here. For example, if you have an Apple running CP/M you should make this ESC\$ + "\*" . However, consider how much easier it is

to change one define as opposed to changing this value wherever you've used it throughout the program.

The two alphabet strings are handy for deciding whether a character is alphabetic and what case it is. To see if A\$ is upper case alpha we would say:

```
IF INSTR(UCASE$,A$) <> 0 THEN (it is)
```

Likewise, we can use these strings to convert between cases. To make A\$ into upper case alpha if it contains an alphabetic character we could say:

```
A = INSTR(LCASE$,A$)
IF A <> 0 THEN A$ = MID$(UCASE$,A,1)
```

You can convert a whole string this way. It's not shattering fast but it is fairly foolproof and easy to program.

```
1500 'CONVERT A STRING TO UPPER
CASE
1510 FOR X=1 TO LEN(A$)
1520 BS$ = MID$(A$,X,1)
1525 B=INSTR(LCASE$,BS$)
1530 IF B <> 0 THEN MID$(A$,X,1) =
MID$(UCASE$,B,1)
1535 NEXT X
1540 RETURN
```

For our next trick...

```
300 'DEFINE FUNCTIONS
310 DEF FNAT$(X,Y) = HM$ +
STRING$(Y,LF$) + STRING$(X,RT$)
320 DEF FNIN$(X) = STRING$(X,BOX$)
330 DEF FNTRUN(X,Y) =
(INT(X*(10^Y)))/(10^Y)
```

The manual for MBASIC makes almost no mention at all about the capability of the language to handle user defined functions. This isn't as unforgivable as it may seem... in contrast to this facility in other dialects, the MBASIC implementation is about as powerful as a wildebeest's tail muscles. However, there are some useful things that can be done with the DEF FN command.

A function is a thing that returns a value or a string. Thus, PEEK is a function, while POKE is a command. DEF FN defines only functions, so you can't use it to make up your own commands.

Unfortunately, MBASIC only permits the definition of very simple functions and the functions which are already provided don't lend themselves to doing a whole lot inside DEF FN's. However, there are some useful bits.

The functions I've included here are particularly handy ones... and fairly illustrative of the practical applications of this obscurity.

The function FNAT\$... defined function names always begin with "FN"... will posi-



# A Small Potful Of BASIC Routines

tion the cursor at location X,Y on the screen... provided that neither co-ordinate is zero. Zero co-ordinates would produce illegal function call errors, as the STRING\$ doesn't like producing null strings.

This function isn't ultra fast on some terminals, as it requires the printing of quite a few control characters. Your system may have a better way to do screen addressing, generally through an escape sequence. However, if you don't know what it is or are trying to write code which is easily transportable this is a fairly good compromise.

FNLIN\$ will return a string of box characters... it's used primarily in a subroutine to be expanded upon later on.

FNTRUN is an example of a numeric function. It truncates the value in X to Y decimal places with no fudging or hassles.

None of these functions do things which couldn't be done just as well with straight up code... in fact, this will be true of any functions you define. However, they are a lot more convenient to use than constantly calling subroutines and, if applied correctly, can produce tighter and faster BASIC programs.

## Submarines

Having dealt with the formalities and ceremonies, let us now procede to the meal. The feature for this evening is a whole roast aardvark. Unfortunately we ran out of forks about an hour ago... patrons will have to eat with their fingers.

The first subroutine in this collection is one to do line input from the keyboard. This is generally handled, in simple applications, by the INPUT statement. However, INPUT presents us with a number of hassles, to wit, it doesn't like commas, insists on printing a question mark even when one isn't particularly appropriate and will input anything, even if it isn't what the program calls for.

This latter limitation is a serious drag in using the thing for, say, financial programs that are supposed accept only numeric data.

This subroutine replaces the INPUT statement.

```
1000 'DO LINE INPUT
1005 C$ = "" : B$ = ""
1010 IFALP$="" THENALP$ = "ABCDEFGH-
      IJKLMNOPQRSTUVWXYZ1234567890 ."
1015 IF ENT = 0 THEN ENT = 20
1020 WHILE B$ <> CR$
1025 B$ = INPUT$(1)
1030 IF INSTR(ALP$ + B$ + CR$ + CAN$,
      B$) = 0 THEN 1025
1035 IF B$ = B$ AND LEN(C$)<41 THEN
      1025
1040 IF B$ = B$ THEN PRINT RUB$ : C$ =
      LEFT$(C$,LEN(C$)-1) : GOTO 1025
1045 IF B$ = CAN$ THEN FOR X=1 TO
```

```
LEN(C$) : PRINT RUB$ : NEXT X : C$ =
      "" : GOTO 1025
1050 IF C$ <> CR$ AND LEN(C$)<ENT
      THEN C$ = C$ + B$ : PRINT B$;
1055 WEND
1060 ALP$ = "" : ENT = 0 : L = LEN(C$) - 1 :
      C$ = LEFT$(C$,L)
1065 RETURN
```

This routine has a number of powerful characteristics. To begin with, it allows the specification of a *match* string in ALP\$, to which all input must conform. If this string is not specified the routine defaults to allowing all upper case alphabetic characters, numbers, a space and a period.

The match string is scanned each time a character is input. If the little troll isn't in ALP\$ or malingering as a control character it is cast into the pit of eternal peril and never heard from again. Thus, if ALP\$ were set to "1234567890 ." and someone typed an "A" it would be ignored.

The routine also allows for the use of control X, something else not entertained by INPUT. Entering control X will erase the entire line, returning the cursor to where it started and null the string... starting the whole mess over, in essence.

The variable ENT defaults to twenty, but you can set it to any value you like. It specifies the maximum allowable length for the line.

This thing will keep looping around until you hit a RETURN. It returns with the inputted string in C\$ and its length in L.

The form of INPUT "Critters";N\$ is actually quite useful... one usually wants to stick a prompt up there.

This next bit of code allows for that...

```
1600 'DO FORMATTED LINE ENTRY
1605 PRINT FNAT$(1,LN)
1610 PRINT TITLES " : " SPACES(ENT) " : "
      STRING$(ENT+1,B$) CUR$ CR$
      TITLES " : " :
1615 GOSUB 1000 'GET ACTUAL INPUT
1620 IF C$ <> "" THEN CUR$ = C$
1625 RETURN
```

This will place the prompt on the line specified by LN and do the parameters as with the input routine we've just checked out... which it calls. However, it allows for a current data entry in CUR\$. This means that the input line can already contain data. If you type something on the line, CUR\$ will come back with the new information. If you don't... and just hit RETURN... the data in CUR\$ will be unchanged.

## Square Pegs

Machines with trendy graphics statements can handle the drawing of boxes in a few lines. For the rest of humanity, however, plotting the things with ASCII characters can be a really unpleasant experience. This

routine will put a fence around anything on the screen, defaulting to framing the entire tube if no parameters are specified for it.

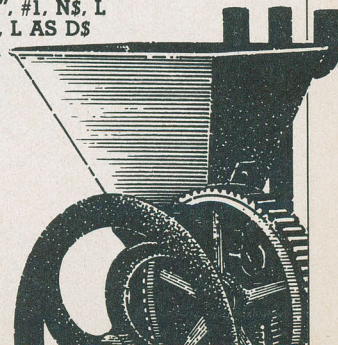
```
1100 'DRAW A BOX
1105 IF X=0 THEN X=1
1110 IF Y=0 THEN Y=1
1115 IF A=0 THEN A=78
1120 IF B=0 THEN B=21
1125 PRINT FNAT$(X,Y);
1130 PRINT FNIN$(A);
1135 FOR J=Y TO Y+B
1140 PRINT FNAT$(X,J) BOX$ FNAT$(X+A,J)
      BOX$;
1145 NEXT J
1150 PRINT FNAT$(X,Y+B) FNIN$(A) HMS;
1155 X=0 : Y=0 : A=0 : B=0
1160 RETURN
```

This routine wants the upper left hand corner of the box in X,Y and the lower right hand corner in A,B. It will plot the box in whatever character is in BOX\$... this should be a reversed out space character, but, for proper psychodelia you might want to try asterisks, question marks or Greek symbols.

The box routine is non-destructive, that is, you can box your way over existing type and it won't be disturbed... unless it happens to be languishing under the walls of the box.

Finally, let's have a quick look at the aspect of MBASIC that gives most users the greatest difficulty, the heavily nasty random file access routines. Here are some typical examples of them. Notice the purple smoke billowing from their nostrils.

```
1300 'WRITE A RECORD TO A RANDOM
      FILE
1305 L=LENGTH OF RECORDS. N$=FILE
      NAME, D$=RECORD DATA
1310 R=RECORD TO WRITE
1315 OPEN "R", #1, N$, L
1320 M$ = SPACES(L)
1325 FIELD #1, L AS M$
1330 LSET M$ = D$
1335 PUT #1,R
1340 CLOSE 1
1345 RETURN
1400 'READ A RECORD FROM A RANDOM
      FILE
1405 L=LENGTH OF RECORDS. N$=FILE
      NAME, D$=RECORD DATA
1410 R=RECORD TO WRITE
1420 OPEN "R", #1, N$, L
1430 FIELD #1, L AS D$
1440 GET #1,R
1450 CLOSE 1
1460 RETURN
```







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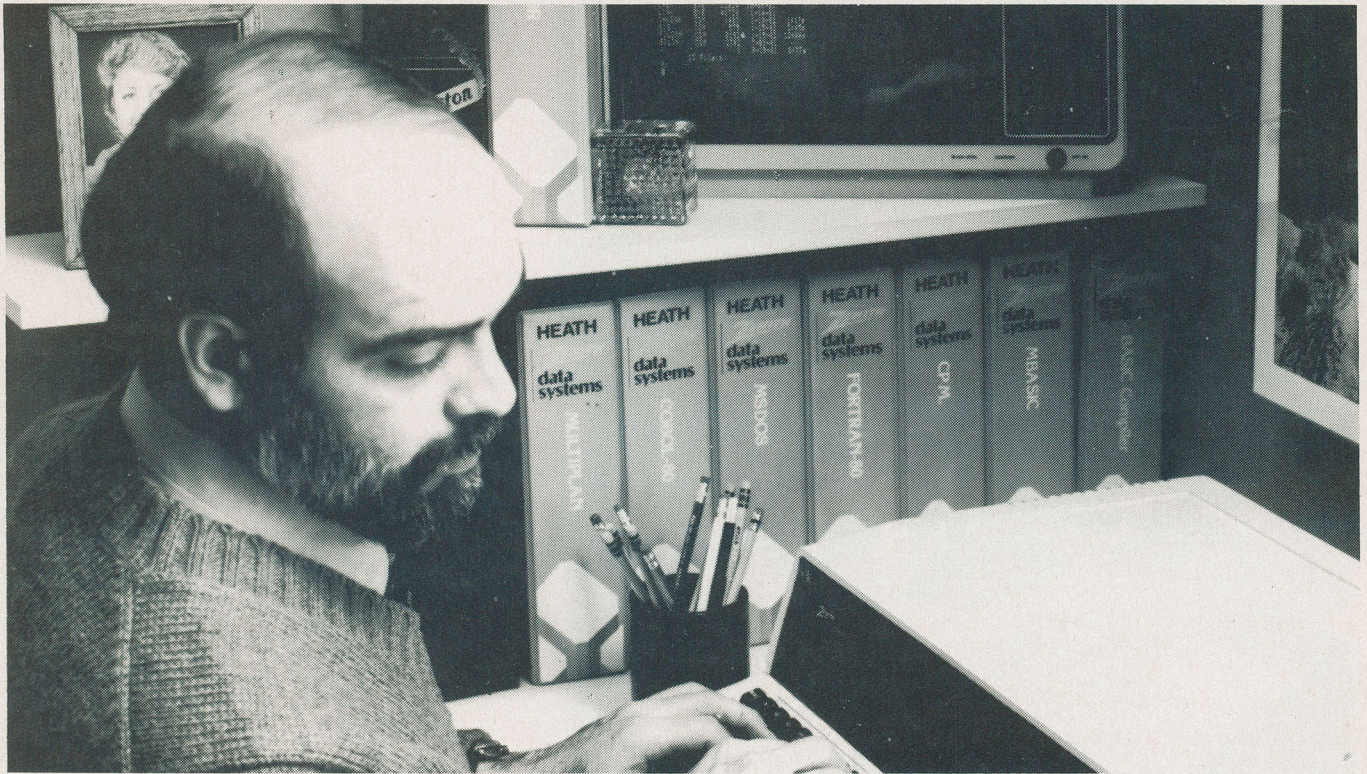
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# A Small Potful Of BASIC Routines



To begin with, random files don't need any error trapping to handle things like not finding the file or reading unreal records. OPENing a random file automatically creates it if it isn't already on the disk and reading any record will return data... it's up to you to decide whether its flotsam or not.

Each random file must have a record length, held in L here for clarity, which must be specified upon first opening the file and thereupon never changed lest the sleeping dragons awake and chew your typing finger. This length is important, as, knowing it, the operating system is able to select the record you call for.

The record numbers being specified here are held in R. If you set R to two you'll read or write the second record.

The general syntax of the random files should be fairly understandable in these examples... there aren't too many weird bits added to them. To begin with, to write a random file we have to OPEN it. If you open a file with thirty-two byte records in it, for example, and write a record with only twenty characters in it the other twelve characters will be returned as garbage when the record is read back. Since the file won't get any smaller if the records aren't filled... this is one of the limitations of random files... we might as well make them pretty. Thus, the record, M\$, is padded out

with spaces to fill it out to the full record length.

The FIELD statement tells BASIC that the string M\$ should be regarded as the buffer through which random data is to pass. In other words, having issued this statement if we later tell BASIC to go ahead and write the record it will do so with whatever data is in M\$.

LSET gets the data passed to the routine in D\$ and puts it in M\$. Note, however, that this is not the same as saying M\$ = D\$. LSET left justifies D\$ in M\$, leaving any bytes of M\$ which aren't overlayed by D\$ in place, so that M\$ retains its original length.

The PUT statement actually does the writing, putting M\$ in the file at record R.

Reading the record back is rather easier... as you can see. Once again, the FIELD statement defines the variable D\$ as a buffer to hold the random record when it appears. The GET statement causes record R to show up in the buffer, D\$, which can thereafter be treated like any other string.

## BASball

These routines have gotten into only a few of the fairly large number of clever things one can bring to reality with Microsoft BASIC. However, they should serve to illustrate an approach to programming in this

flexible, user friendly tongue. You can do a lot more with it than you'd immediately think.

Much of the effort in programming in BASIC is in getting your head around the idea that programming should be structured even if it doesn't necessarily have to be. By treating the individual functions of your programs as separate blocks of code you will find that things flow together a lot more readily... and that the multi-legged critters that inhabit most code at the onset will be easier to locate and mash into tiny skittering harmless bits.

By building up your own STASH.BAS file you'll invariably find that your program development will be a lot less painful. After two or three large projects you should be in possession of a pretty good STASH... the more programs you write the more your code will simply become calls into this. It's cheap, slimy, un-high tech and nasty... but it produces first rate code in a very short time.

Keep in mind that BASIC compilers hide a multitude of sins when you finally get the whole thing working. **CN!**







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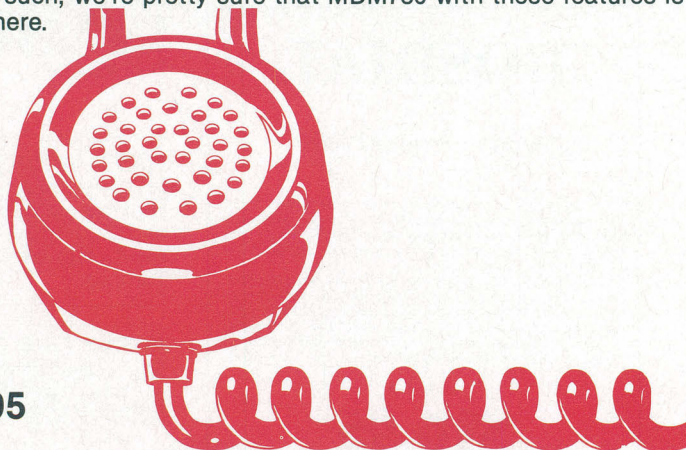
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The source code file for this program is over a hundred and fifty kilobytes long. It cannot be hacked on a standard Apple. We patched it on a larger machine and downloaded it. As such, we're pretty sure that MDM730 with these features is unavailable elsewhere.



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The original MDM730 code is in the public domain. We are offering this part of the program without cost. The charges for this package are for the patches created by Computing Now! and to defer the cost of handling and postage.

This software is guaranteed to work correctly if properly applied. The serial cards must be installed in slot two of an Apple II+ compatible system with at least 48K of RAM running Microsoft CP/M 2.2. The PDA 232C version will require the availability of either a Hayes SmartModem or a modem with pin twenty five line control to dial. Users of the SSM card version may experience some difficulty in detecting extremely faint carriers on older versions of this card.

Moorshead Publications,  
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## COMPUTER PRESS

*Radio Shack* is offering a plan for computer users similar to its battery of the month club. When used once a month, the **Diskette Club** card entitles holders to purchase a package of three diskettes at a 40 percent discount...

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Data security is always a major business problem. *Digital Signature* offers three encryption programs for the IBM PC based on the RSA public key cryptosystem. The **Crypt Master** programs offer up to 2<sup>160</sup> different possible passwords for any given protected file...

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Inspired by the novels of science fiction authors Arthur C. Clarke, Robert Heinlein and Michael Crichton, *Trilium Corporation* has announced a series of computer **adventure games**. The software will run on the Apple II series and Commodore 64 computers, with some also available for Atari...

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*Information Access Company* is providing online full text magazine databases through Dialog Information Services. Entire article contents are available from more than 130 magazines and business journals on **Magazine ASAP** and **Trade and Industry ASAP** at no extra charge to Dialog subscribers...

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The new **MicroMate Power Conditioners** from *Oneac Canada*, by reducing electronic noise, reduce resulting data loss and processing errors. Business users can also reduce their service costs with the conditioners...

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**Turbo Pascal** version 2.0 is being distributed in Canada by *Praxtek Computer Corporation*. The fast, popularly priced Pascal compiler is available on PC-DOS, MS-DOS, CP/M-80 and CP/M-86 based computers...

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Circle No. 13 on Reader Service Card



# LIST!

Most computer users have at least one major project in the works and we have all experienced the odd sensation of coming out of an analytical fog to discover that the sun is just peering over the rooftops and the night has been spent in revisions. It is for this reason that small programs exist. They can't simulate attacks from the Crab Nebula or figure out the exact value of Pi but they're fun, or clever or just diverting. On these pages we present some of the programs submitted by our readers or dreamed up by ourselves... after giving up on the software for the matter transporter.

Readers are invited to submit programs for LIST!. They should be printed out with a reasonably new ribbon... we cannot accept hand written or hand typed software... and of a length that can be dealt with in one printed page or so (or less). We suggest that the author's name and address appear somewhere in the listing. We pay for programs on publication.

## Battlestar Galactica by Monte Greenway

Vying for position with Star Trek for the most emulated defunct space opera, this classic has been translated into code for the Acorn Atom. Featuring a visual display and fast action, it will turn your computer into a real spaceship if you have a great deal of imagination.

```

10 P.$12;@=0
20 P."      battlestar galactica"
30 P.'
40 P."commands"
50 P."1=SCAN APPROCHING SHIP"
60 P."2=SCAN AREA FOR SHIPS"
70 P."3=SCAN APPROCHING PLANET"
80 P."4=PRINT OUT FUEL REMAINING"
90 P."5=FIRE TORPEDOES"
100 IN."commands"
110 IF C=2 G.810
120 IF C=3 G.500
130 IF C=4 G.860
140 IF C=5 G.920
150 A=A.R.%2+1
160 IF A=1 G.180
170 IF A=2 G.330
180 P.$12 ;P."scan"
190 P."TYPE:CYLON RAIDER"
200 P."NO.OF PASSENGERS:2"
210 P."TYPE:CYLON CENTURION"
220 P."CLASS:FIGHTER"
230 P."      *****"
240 P."      *****" ;P."      top view"
250 P."      []      []"
260 P.'
270 P.'
280 P." *****"
290 P."*****";P."      side view"
300 P."]"
310 FOR X=1 TO 10000;N.X;P.$12
320 G.40
330 P.$12;P."scan"
340 P."TYPE:COLONIAL VIPER"
350 P."NO.OF PASSENGERS:1"
360 P."TYPE:HUMAN"
370 P."CLASS:LIGHT FIGHTER"
380 P.'
390 P."      *****"
400 P."      *      "
410 P."      *      ";P."      top view"
420 P."      *      "
430 P."      **     *****"
440 P."      *      *****"
450 P."      *      *****"
460 P."      *      *****"
470 P."      []*****[]"
480 FORW=1 TO 10000;N.;P.$12;G.40

```

```

490 P.$12;G.40
500 Z=A.R.%2+1;Q=A.R.%2+1
510 P."1=ZAD"
520 P."2=CYLON"
530 P."3=EARTH"
540 IN."ENTER YOUR CHOICE"
550 IF P=1 G.590
560 IF P=2 G.670
570 IF P=3 G.720
580 IF P<3 G.500
590 R=A.R.%2+1;Z=ABSRND%100+1;P.$12
600 IFR=1 P."THE PLANET IS LIFE LESS"
610 IFR=2 G.620
620 P."NAME:ZAD"
630 P."TYPE:HELIUM ATMOSPHERE"
640 P."NO.OF CYLONS:"Z"
650 P."LOCATION:SECTOR 6"
660 F.X=1 TO 10000;N.X;P.$12;G.40
670 Z=A.R.%500;Q=ABSRND%2+1
680 P.$12;P."planet scan"
690 P."TYPE:CYLON"
700 P."THERE ARE "Z"CYLONS"
710 FORX=1 TO 10000;N.X;G.40
720 Z=ABSRND%2+1;Q=A.R.%2+1
730 P.$12;IFQ=1 G.760
740 IFQ=2 G.750
750 P."PLANET IS LIFELESS"
760 Z=ABSRND%2+1;Q=A.R.%2+1
770 P.$12;P."planet scan"
780 P."NAME:EARTH"
790 P."TYPE OF LIFE:HUMAN"
800 FORX=1 TO 10000;N.X;P.$12;G.40
810 Q=ABSRND%2+1
820 P.$12;P."scan readout"
830 IFQ=1 P."NO SHIPS IN THIS SECTOR"
840 IFQ=2 P."INCOMING SHIP"
850 FORX=1 TO 10000;N.X;P.$12;G.40
860 P.$12
870 P."      fuel consumption report"
880 F=A.R.%5+1;G=ABS(100/F)
890 P."YOUR FUEL IS PRESENTLY "G" UNITS"
900 P."WHICH MEANS YOU HAVE "(100-G)" LEFT"
910 F.X=1 TO 10000;N.X;G.40
920 S=A.R.%5+1
930 P."ENTER LOCATION OF ENEMY"
940 INPUT V
950 IF V=S P.$12
960 P." ***"
970 P."*****"
980 P." ***"
990 IF V<S G.1010
1000 P."[*]"
1010 P."YOU MISSED BY "(S-V)
1020 F.X=1 TO 10000;N.X;P.$12;G.40
1030 END

```

## Lunar Lander by Roger Bowes

Any landing you can crawl off into a crater and wait for rescue after, is a good one. This version of the popular game runs on the TRS-80 Model I and III.

```

10 REM ** LUNAR LANDER **
20 REM BY ROGER BOWES 25 MELVILLE RD, PETERBOROUGH ONT, K9J 6K9
30 CLS: T=0
40 A=1;B=2;FL=300;L=0
50 PRINT:PRINT
60 PRINT "YOU MUST TRY TO LAND THE SPACE SHIP ON THE MOONS SURFACE"
70 PRINT "USE THE ARROWS TO CONTROL YOUR SHIP AND PRESS (SPACE) TO SHUT DOWN YOUR ENGINES ONCE YOU HAVE LANDED"
80 PRINT "HIT (ENTER) TO START"
90 IF INKEY$(CHR$(13)) THEN GOTO 90
100 CLS:D=0:E=3
110 PRINT @ RND(960);".":L=L+1:IF L>25 GOTO 130
120 GOTO 110

```

cont'd next page



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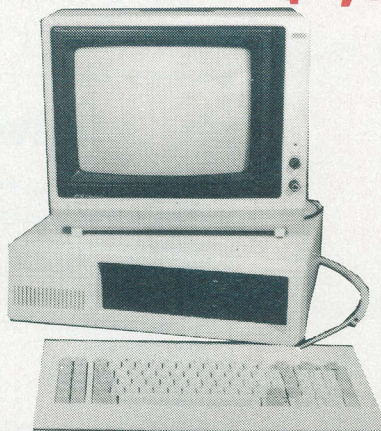
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# LIST!

```

130 A$=CHR$(191)+CHR$(188)+CHR$(180): J=989
140 X=RND(11)+179:IF X=182 OR X=183 OR X=185 OR X=187 GOTO140
150 PRINT @ J,CHR$(X): J=J+1: IF J>1005 GOTO 170
160 GOTO 140
170 PRINT @ 320,A$;
180 PRINT @ 384,STRING$(3,191);A$;PRINT @ 448,STRING$(6,191);A$;
190 PRINT @ 512,STRING$(8,191);A$;PRINT @ 576,STRING$(11,191);A$;
200 PRINT @ 640,STRING$(17,191);A$;PRINT @ 704,STRING$(20,191);A$;
210 PRINT @ 768,STRING$(22,191);A$;PRINT @ 832,STRING$(24,191);A$;
220 PRINT @ 896,STRING$(27,191);A$;
230 PRINT @ 960,STRING$(30,191);:PRINT @ 1021-25,STRING$(3,188);
240 B$=CHR$(160)+CHR$(190):PRINT @ 639-3,B$;
250 PRINT @ 697,B$;STRING$(3,191);:PRINT @ 758,B$;STRING$(6,191);
260 PRINT @ 818,B$;STRING$(10,191);:PRINT @ 880,B$;STRING$(12,191);
270 PRINT @ 941,B$;STRING$(15,191);:PRINT @ 1006,STRING$(16,191);
280 SET(B,E):SET(B+1,E):SET(B-1,E+1):SET(B+2,E+1)
290 PRINT @ 5,"FUEL";FL;"000 UNITS ";:IF FL<1 THEN FL=1
300 PRINT@ 45,"ELSPSED TIME";T;
310 M=PEEK(14400):IF M=0 THEN GOTO 370
320 IF M=8 THEN D=D-.25
330 IF M=16 THEN D=D+.25
340 IF M=32 THEN A=A-.25
350 IF M=64 THEN A=A+.25
360 IF INKEY$="" THEN GOTO 430
370 T=T+1:RESET(B,E):RESET(B+1,E):RESET(B-1,E+1):RESET(B+2,E+1)
380 IF FL<2 : D=D+.25 : PRINT@470," YOU RAN OUT OF FUEL";
390 B=B+A:E=E+D:FL=FL-1:IF D<.5 FL=FL-2
400 IF POINT(B-1,E+1) THEN GOTO 540
410 IF POINT(B+2,E+1) THEN GOTO 540
420 GOTO 280
430 IF POINT(B-1,E+2) AND POINT(B+2,E+2) AND FL>0THEN GOTO 500
440 IF POINT(B-1,E+2) OR POINT(B+2,E+2) THEN GOTO 540
450 RESET(B,E):RESET(B+1,E):RESET(B-1,E+1):RESET(B+2,E+1)
460 E=E+2
470 SET(B,E):SET(B+1,E):SET(B-1,E+1):SET(B+2,E+1)
480 IF POINT(B,E+1) THEN GOTO 540
490 GOTO 450
500 FOR Z=1 TO 3000:NEXT
510 CLS:PRINT:PRINT:PRINT
520 PRINT"CONGRATULATIONS YOU HAVE SUCCESSFULLY LANDED THE LUNAR
LANDER"
530 FOR Z=1 TO 2000: NEXT Z: GOTO 30
540 Q=B: A=B: Z=B: W=E: S=E: X=E
550 IF Q<2 OR S<2 OR Z>126 THEN GOTO 590
560 RESET(Q,W): Q=Q-1: W=W-1: SET(Q,W): RESET(A,S)
570 S=S-1: SET(A,S): RESET(Z,X): X=X-1: Z=Z+1
580 SET(Z,X): GOTO 550
590 CLS: GOTO 30

```

## Quicksort

from CN! June 1983

Adapted by G.B. Lloyd

This is a ZX-81 implementation of the sorting routine we ran in CN!

```

100 REM Quick sort Feb 24 84 G.B. LLOYD
110 REM Adapted from CN June 83 Issue
120 N=100
122 DIM S$(N+1)
124 DIM L(20)
126 DIM H(20)
130 FOR I= 1 TO N
140 N1=INT (RND*5+1)
145 LET A$=""
150 FOR J=1 TO N1
160 B$=CHR$(INT (RND*26+65))
170 A$=A$+B$
180 NEXT J
190 S$(I)=A$
200 NEXT I
300 FOR I=1 TO N
310 PRINT I;" " = ";S$(I);
320 NEXT I
400 PRINT"sorting.."
410 GOSUB 4000
420 PRINT
430 FOR I=1 TO N
440 PRINT I;" " = ";S$(I);" ";
450 NEXT I
500 PRINT "sort finished ";N;" elements ordered"
510 STOP
4000 LET L(2)=1
4010 LET H(2)=N+1

```

```

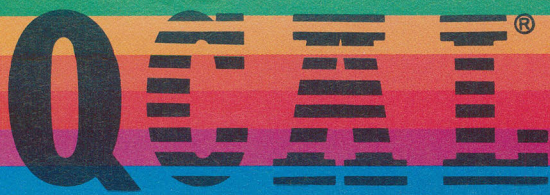
4015 LET II=2
4020 IF II=1 THEN RETURN
4030 IF L(II)=>H(II) THEN GOTO 5000
4040 LET I=L(II)-1
4041 LET J=H(II)
4042 LET IL=J
4050 IF I=>J THEN GOTO 4100
4060 LET I=I+1
4065 IF S$(I)<S$(IL) THEN GOTO 4060
4070 LET J=J-1
4075 IF J>I AND S$(J)>S$(IL) THEN 4070
4080 IF I<J THEN GOSUB 5050
4090 GOTO 4050
4100 LET J=H(II)
4102 GOSUB 5050
4106 IF I-L(II)<H(II)-1 THEN GOTO 5100
4110 LET L(II+1)=I+1
4112 LET H(II+1)=H(II)
4116 LET H(II)=I-1
4120 LET II=II+1
4125 GOTO 4020
4999 REM
5000 LET II=II-1
5010 GOTO 4020
5040 REM swap
5050 LET T$=S$(I)
5060 LET S$(I)=S$(J)
5070 LET S$(J)=T$
5080 RETURN
5100 REM
5110 LET L(II+1)=L(II)
5120 LET H(II+1)=I-1
5130 LET L(II)=I+1
5140 GOTO 4120

```

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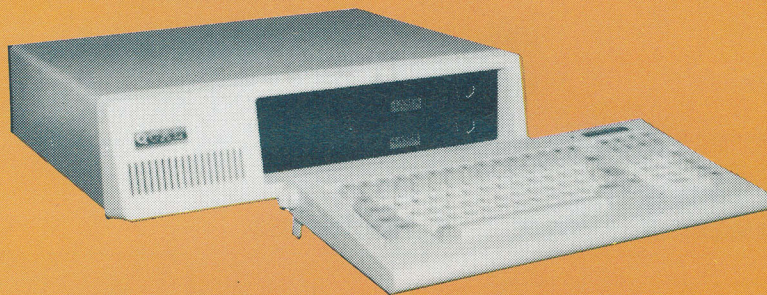




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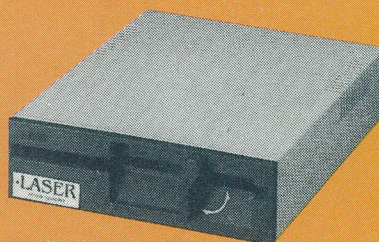
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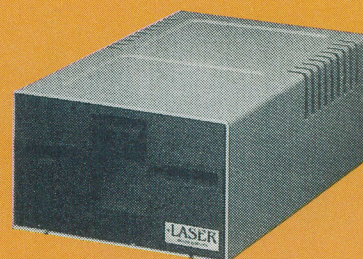
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